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(54) Title: CONTAINER AND CARTRIDGE FOR DISPENSING PAPER PRODUCTS					
(57) Abstract					
<p>A container (10) for dispensing individual paper products (12), the container includes a housing (14) including a plurality of exterior walls defining an interior surface (30) and an interior area (28) within the interior surface (30) for receiving a plurality of the paper products (12). A first end wall (40) defines a dispensing throat (32) for permitting removal of paper products (12) from the interior area (28). A mechanism urges paper products within the interior area (28) toward the dispensing throat (32) in a dispensing direction (44). Protrusions (50) extend from the portion of the interior surface on the second (20) and third exterior walls (22) into the interior area (28) for contacting the paper products (12) to oppose the mechanism for urging. The protrusions (50) on the second wall are staggered from the protrusions on the third wall (22) in the dispensing direction (44). Additional protrusions may be disposed on the first wall (18), fourth wall (24) and first end wall (40) proximate the dispensing throat (32). A cartridge (262) may be provided for holding and dispensing paper products (12) from the container (10).</p>					

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CONTAINER AND CARTRIDGE FOR  
DISPENSING PAPER PRODUCTS

Background of the Invention

This invention relates generally to the field  
5 of dispensing devices and systems. More  
particularly, this invention relates to the field of  
devices and systems for dispensing paper products  
such as napkins, towels, toilet tissue, etc.

Various types of dispensers for paper products  
10 have been developed to provide ready availability of  
the paper products to users. Such dispensers are  
often provided in public places such as restaurants  
or rest rooms where customers remove from the  
dispenser a desired amount of paper products for  
15 personal use. In some high traffic areas, such as  
fast food restaurants, a large number of customers  
may use a paper product dispenser such as a napkin  
dispenser in a short period of time. Therefore,  
dispensers have been developed that hold a large  
20 number of paper products for use by a large number  
of consumers.

Unfortunately, large dispensers are subject to  
a number of drawbacks. First, it is difficult to  
uniformly dispense individual paper products or a  
25 controlled amount of paper products from a large  
dispenser without dispensing more paper products  
than necessary to a user. Thus, too many paper  
products are removed by a user, and some of the

paper products are wasted. If too many paper products are removed from a dispenser, the benefits provided by a larger dispenser are eliminated as the dispenser is emptied more rapidly.

5        Second, many dispensers are difficult to load, and that difficulty can increase with the size of the dispenser. If paper products are not properly loaded into the dispenser, the paper products may jam as they are removed thereby preventing further removal of paper products by users. Also, a person refilling a large dispenser is more likely, due to the larger number of paper products involved, to drop some of the paper products onto a floor. Any dropped paper products are then unsanitary and must 10      be discarded, thereby creating more waste and again 15      defeating the benefits of the larger dispenser.

A further drawback of many currently available dispensers regardless of size is that it is impossible to determine without opening the 20      dispenser how many paper products remain within the dispenser. Thus, a person must either periodically check the dispenser to determine how many paper products remain or be vigilant to refill the dispenser as soon as it is empty. Both alternatives 25      involve much personal attention and, especially during peak usage, can lead to empty dispensers if dispensers are not vigilantly monitored.

Objects and Summary of the Invention

It is a principle object of the present invention to provide an improved container and cartridge for dispensing paper products that can be readily adapted to various applications.

Another object of the present invention is to provide a container and cartridge for dispensing paper products that are simple and inexpensive to manufacture, and that are reliable in use.

Still another object of the present invention is to provide a container and cartridge for dispensing paper products that provide metered delivery of individual paper products or a controlled amount of paper products.

Yet another object of the present invention is to provide a container and cartridge for dispensing paper products that reduce the incidence of waste of the paper products, either due to dispensing too many paper products to a user or due to dropping of the paper products during refilling of the container.

Still another object of the present invention is to provide a container and cartridge for dispensing paper products that provide an indication of the remaining amount of the paper products ready for dispensing to users.

Yet another object of the present invention is to provide a container and cartridge for dispensing

paper products that reduce the incidence of jamming of paper products and the resultant inability to dispense further paper products.

Still another object of the present invention  
5 is to provide a container and cartridge for dispensing paper products that supports the weight of paper products so that individual paper products are readily removed.

To achieve these objects and in accordance with  
10 the purposes of the invention, as embodied and broadly described herein, a container for dispensing individual paper products is provided, the container including a housing including a plurality of exterior walls defining an interior surface and an  
15 interior area within the interior surface for receiving a plurality of the paper products. A first end wall defines a dispensing throat for permitting removal of paper products from the interior area. Alternatively and/or additionally,  
20 the dispensing throat may be located in an exterior wall. A mechanism urges paper products within the interior area toward the dispensing throat in a dispensing direction. A first, second and third of the exterior walls intersect the first end wall on  
25 opposite sides of the first exterior wall and form a portion of the interior surface. Protrusions extend from the portion of the interior surface on the second and third exterior walls into the interior

area for contacting the paper products to oppose the means for urging. The protrusions on the second wall are staggered from the protrusions on the third wall in the dispensing direction.

5       The urging mechanism may include a spring-loaded plate disposed in the interior area of the housing for urging the paper products in the dispensing direction, and the dispensing direction may be substantially horizontal. Alternately, the  
10      mechanism for urging may include an attachment portion of the housing for attaching the housing to a substantially nonhorizontal surface, the paper products being urged in the dispensing direction by gravity, and the dispensing direction may be  
15      substantially vertical.

Preferably, the protrusions include curved bumpers, and, more preferably, the curved bumpers include a plurality of ridges extending across the curved bumpers perpendicular to the dispensing direction.

20      Preferably, the housing further includes a staging area proximate the dispensing throat for spacing and slowing the paper products, the staging area including rib members extending parallel to the dispensing direction for contacting and/or aligning the paper products and opposing the mechanism for urging. In embodiments of the invention such as, for example, where the dispensing throat is located in  
25

an exterior wall, the staging area may be configured with at least one rib member extending parallel to the dispensing direction and a number of teeth extending from the rib member for contacting the paper products and opposing the mechanism for urging.

A given one of the exterior walls may include a door hingedly attached to the housing, the door being openable for insertion of the plurality of paper products into the interior area.

Optionally, a cartridge may be provided for insertion into the interior area of housing for containing the plurality of paper products, and the cartridge preferably includes removable portions, removal of the removable portions creating openings in the cartridge. At least one of the openings in the cartridge is preferably disposed adjacent at least one of the protrusions so that the protrusion extends through the opening to contact the plurality of paper products. Rib members are preferably provided in the interior area of the housing proximate the dispensing throat and at least a portion of the openings in the cartridge being disposed adjacent rib members so that the rib members extend through the openings to contact, align and/or support the plurality of paper products. In some embodiments of the invention such as, for example, embodiments having the dispensing

throat positioned on an exterior wall, at least one rib member is provided in an interior area of the housing proximate the dispensing throat, the rib members including teeth extending from the rib member, at least one of the openings in the cartridge being disposed adjacent at least one of the rib members so that the teeth extend through the openings to contact the plurality of paper products.

In accordance with another aspect of the invention, a container for dispensing individual paper products is provided, the container including a housing including a plurality of exterior walls defining an interior surface and an interior area within the interior surface for receiving a plurality of the paper products. A first end wall defines a dispensing throat for permitting removal of paper products from the interior area. Alternatively and/or additionally, the dispensing throat may be located in an exterior wall. A mechanism urges paper products within the interior area toward the dispensing throat in a dispensing direction. At least one protrusion extends from the interior surface into the interior area of the housing. A cartridge is provided for insertion into the interior area of the housing for containing the plurality of paper products, the cartridge including at least one removable portion, removal of the removable portion creating an opening in the

cartridge. The opening in the cartridge is disposed adjacent the protrusion so that the protrusion extends through the opening to contact the plurality of paper products to oppose the means for urging  
5 when the cartridge is placed in the interior area of the housing.

Preferably, the cartridge includes a second removable portion, removal of the second removable portion creating a second opening in the cartridge,  
10 and wherein the mechanism for urging includes a spring-loaded plate disposed in the interior area of the housing and extending through the second opening for urging the paper products in the dispensing direction, the dispensing direction being preferably substantially horizontal. Alternately, the  
15 mechanism for urging includes an attachment portion of the housing for attaching the housing to a substantially nonhorizontal surface, the paper products being urged in the dispensing direction by gravity, the dispensing direction preferably being substantially vertical.  
20

A first, second and third of the exterior walls intersect the first end wall on opposite sides of the first exterior wall, the at least one protrusion including a plurality of protrusions extending from the second and third exterior walls into the interior area, the protrusions including curved bumpers, the curved bumpers preferably including a  
25

plurality of ridges extending across the curved bumpers perpendicular to the dispensing direction.

Preferably, a staging area is provided proximate the dispensing throat for spacing and slowing the paper products, the staging area including rib members extending parallel to the dispensing direction for contacting, aligning and/or supporting the paper products and opposing the means for urging. In some embodiments of the invention such as, for example, embodiments having the dispensing throat positioned on an exterior wall, at least one rib member is provided in an interior area of the housing proximate the dispensing throat, the rib members including teeth extending from the rib member, at least one of the openings in the cartridge being disposed adjacent at least one of the rib members so that the teeth extend through the openings to contact the plurality of paper products.

In accordance with another aspect of the invention, a container for dispensing individual paper products is provided, the container including a housing including a plurality of exterior walls defining an interior area for receiving a plurality of the paper products. A first end wall defines a dispensing throat for permitting removal of paper products from the interior area. Alternatively and/or additionally, the dispensing throat may be located in an exterior wall. A mechanism urges paper

products within the interior area toward the dispensing throat in a dispensing direction. A first, second and third of the exterior walls intersect the first end wall on opposite sides of the first exterior wall. A first group of protrusions extends from the second and third exterior walls into the interior area. A fourth of the exterior walls may include a door hingedly attached to the housing, the door being openable for insertion of the plurality of paper products into the interior area. A second group of protrusions extends from the first wall and the fourth wall into the interior area and are desirably in contact or communication with the first end wall. The first and second groups of protrusions contact the paper products to align, support to paper products and/or to oppose the mechanism for urging.

Desirably, the first group of protrusions includes curved bumpers, which preferably include a plurality of ridges extending across the curved bumpers perpendicular to the dispensing direction. Desirably, the second group of protrusions are rib members disposed in a staging area proximate the dispensing throat for spacing, aligning, supporting and/or slowing the paper products. In embodiments of the invention such as, for example, where the dispensing throat is located in an exterior wall, the staging area may be configured with at least one

rib member extending parallel to the dispensing direction and a number of teeth extending from the rib member for contacting the paper products and opposing the mechanism for urging.

5 In accordance with another aspect of the invention, a cartridge for holding and dispensing a plurality of paper products is provided. The cartridge being insertable into an interior area of a container having a housing, the interior area being disposed within an interior surface defined by a plurality of exterior walls, at least one protrusion extending from the interior surface into the interior area. In some embodiments, the protrusions may be rib members in the interior of 10 the housing proximate the dispensing throat. The cartridge includes a cartridge body having cartridge walls and removable sections defined in the cartridge body, removal of at least a portion of the removable sections creating openings through at 15 least one of the cartridge walls, the removable sections being located on the cartridge body so that when the cartridge is placed in the interior area of the housing the protrusions (some or all of which may be in the form of rib members) extend through at 20 least a portion of the openings to contact the plurality of paper products.

The cartridge walls may include two opposing walls and at least two removable sections are

provided, each removable section being disposed on one of the cartridge opposing walls. Desirably, the cartridge walls include four cartridge side walls and at least four removable sections are provided, 5 each removable section being disposed on one of the cartridge side walls.

The cartridge may define at least one slot through one of the cartridge walls, the slot being visible from outside the housing when the cartridge 10 is in the interior area of the housing, an amount of paper products disposed within the cartridge being determinable by visually inspecting the amount of paper products through the slot.

In accordance with yet another aspect of the 15 invention, a container for dispensing individual paper products from a cartridge holding a plurality of paper products is provided, the container including a housing having a plurality of exterior walls defining an interior area for receiving a plurality of the paper products. A first end wall 20 is located at an end of the container. A mechanism urges paper products within the interior area toward the first end wall in a dispensing direction. A first, second and third of the exterior walls intersect the first end wall on opposite sides of 25 the first exterior wall. The configuration of exterior walls and the end wall define an open face of the container. Cartridge retaining means in the

form of one or more small blocks, chucks, stops, wires, braces, brackets, pins, bars, clips or the like are desirably configured on the first end wall or opposing exterior walls. A finger slot may be cut 5 into the first end wall.

In some embodiments, a first group of protrusions may extend from the second and third exterior walls into the interior area. It is contemplated that a fourth exterior wall may include 10 on the container. The fourth exterior wall may be a partial wall or a partial door hingedly attached to the housing, the door being openable for insertion of the plurality of paper products into the interior area. If a fourth wall is used, it may terminate 15 away from and avoid intersecting the first end wall so it in serves as a cartridge retaining means while still defining an open face of the container. Alternatively, the fourth wall may intersect or contact the first end wall to define a dispensing 20 throat.

If the fourth wall is configured to intersect or contact the first end wall to define a dispensing throat, the dispensing throat thereby desirably defines a horizontal dimension that is about the 25 same as or slightly greater than the width of the paper products within the container (or cartridge) and a vertical dimension that is large enough to permit the passage of a limited number of paper

products. For example, if the paper products are in the form of folded paper napkins, the vertical dimension of the dispensing throat may be sized so that a limited number of folded paper napkins may be extracted. This could be achieved by making the vertical dimension some multiple of the thickness of an individual folded paper napkin (e.g., greater than about two and less than about ten thicknesses).

In some embodiments, a second group of protrusions may extend from the first wall into the interior area and may desirably be in contact or communication with the first end wall. If utilized, the first and second groups of protrusions contact the paper products to align, support to paper products and/or to oppose the mechanism for urging.

Desirably, the first group of protrusions includes curved bumpers, which preferably include a plurality of ridges extending across the curved bumpers perpendicular to the dispensing direction. Desirably, the second group of protrusions are rib members disposed in a staging area proximate the dispensing throat for spacing, aligning, supporting and/or slowing the paper products.

A cartridge for holding and dispensing a plurality of paper products may be inserted into the interior area of the above-described container, the interior area being disposed within an interior surface defined by a plurality of exterior walls. In

some embodiments, at least one protrusion extends from the interior surface of the container into the interior area. The protrusion or protrusions may be curved bumpers or may be rib members in the interior 5 of the housing proximate the first end wall.

Generally speaking, the cartridge includes a cartridge body having cartridge walls and may further include removable sections defined in the cartridge body generally as described above for 10 other cartridge embodiments. Since some of the container embodiments described above may have an open face rather than a dispensing throat, the cartridge wall positioned in the open face of the container may include a slit, slot, orifice or 15 channel that may serve to control access to the paper products held within. Desirably, the slot is defined by the front wall and the bottom wall of the cartridge. However, it is contemplated that other locations may be used.

20 The slit is desirably sized so that its horizontal dimension is about the same as or slightly greater than the width of the paper products within the cartridge and its vertical dimension is large enough to permit the passage of a 25 limited number of paper products. For example, if the paper products are in the form of folded paper napkins, the vertical dimension of the slit may be sized so that a limited number of folded paper

napkins may extracted. This could be achieved by making the vertical dimension some multiple of the thickness of an individual folded paper napkin (e.g., greater than about two and less than about 5 ten thicknesses).

The paper product may be accessed by a thumb slot and/or a finger slot. Desirably, the thumb and finger slots are located on the front and bottom faces of the cartridge.

10 The cartridge may define at least one slot through one of the cartridge walls, the slot being visible from outside the housing when the cartridge is in the interior area of the housing, an amount of 15 paper products disposed within the cartridge being determinable by visually inspecting the amount of paper products through the slot.

Additional objects and advantages of the invention will be set forth in part in the following description, or may be obvious from the description, 20 or may be learned through the practice of the invention.

#### Brief Description of the Drawings

The present invention will be more fully understood from the following detailed description, 25 taken in conjunction with the accompanying drawings (not to scale), wherein like reference numerals refer to like parts, and in which:

FIG. 1 is a perspective view of an exemplary container for dispensing paper products.

FIG. 2 is a cross-sectional view of the container of FIG. 1 taken along line 2-2 in FIG. 1.

5 FIG. 3 is a view of a cross-section of an exemplary curved bumper protrusion of the container shown in FIG. 2.

10 FIG. 4A is a partial sectional view of a lower portion of the container shown in FIG. 1 taken along a line perpendicular to line 2-2 in FIG. 1 showing an exemplary arrangement of rib members.

FIG. 4B is a cross-sectional view of an exemplary tall rib member taken along line 3-3 of FIG. 4A.

15 FIG. 4C is a cross-sectional view of an exemplary short rib member taken along line 4-4 of FIG. 4A.

20 FIG. 4D is a top view showing an exemplary arrangement of rib members proximate a dispensing throat.

FIG. 5 is a diagrammatical view of a preferred mounting arrangement of the container shown in FIG. 2, mounted on a substantially vertical wall.

25 FIG. 6 is a sectional view of an exemplary container according to another embodiment of the invention.

FIG. 7 is perspective view of an exemplary housing of a container according to yet embodiment of the present invention.

5 FIG. 8A is a perspective view of an exemplary cartridge according to an embodiment of the present invention shown in FIG. 7.

FIG. 8B is a partial perspective view showing another embodiment of the cartridge of FIG. 8A.

10 FIG. 9 is a perspective view of an embodiment of the invention showing an exemplary cartridge placed in an exemplary housing depicted in FIG. 7.

FIG. 10 is a partial perspective view of another exemplary container for dispensing paper products.

15 FIG. 11 is a perspective view of a housing of another exemplary container.

FIG. 12 is a sectional view of a rib member with teeth proximate a dispensing throat.

20 FIG. 13 is a perspective view of another exemplary cartridge.

FIG. 14 is a partial perspective view showing another embodiment of the cartridge of FIG. 13.

25 FIG. 15 is a perspective view of another exemplary embodiment showing a cartridge placed in the exemplary housing shown in FIG. 11.

FIG. 16 is a perspective view of a housing of an exemplary container for dispensing individual

paper products from a cartridge holding a plurality of paper products.

FIG. 17 is another exemplary container for dispensing individual paper products from a cartridge holding a plurality of paper products.

FIG. 18 is another exemplary container for dispensing paper products.

FIG. 19 is a perspective view of another exemplary cartridge which is configured for use with the exemplary containers of FIGS. 16 and 17.

FIG. 20 is a perspective view of another exemplary embodiment showing an exemplary cartridge as depicted in FIG. 19 inserted in placed in an exemplary housing as shown in FIGS. 16 or 17.

FIG. 21 is yet another embodiment of an exemplary housing.

FIG. 22 is an exemplary cartridge which is intended to be inserted into the housing shown in FIG. 20.

FIG. 23 is an enlarged cross-sectional view of an exemplary lower portion of an exemplary container and cartridge assembly as shown in FIG. 20.

#### Detailed Description of the Preferred Embodiments

Reference will now be made in detail to the presently preferred embodiments of the invention, one or more examples of which are illustrated in the drawings (not to scale). Each example is provided by way of explanation of the invention and not meant

as a limitation of the invention. For example, features illustrated or described as part of one embodiment or figure can be used on another embodiment or figure to yield yet another 5 embodiment. It is intended that the present invention include such modifications and variations.

As broadly embodied in FIGS. 1-5, a first embodiment of container 10 is disclosed for dispensing paper products 12. Container 10 includes 10 a housing 14 in which paper products 12 are placed and from which paper products 12 are dispensed. Paper products 12 may be paper napkins, paper towels, toilet tissue, or any other similar material.

15 Housing 14 includes a number of exterior walls 16 for housing paper products 12. The housing 14 includes a first end wall 40 and a second end wall 42 opposite the first end wall 40. The first end wall 40 includes a dispensing throat 32 through 20 which paper products 12 are individually removed by a user, as will be described below. Alternatively and/or additionally, the dispensing throat 32 may be located in one or more of the exterior walls 16. The exterior walls 16 include a first wall 18, a second 25 wall 20 and a third wall 22 that intersect the first end wall 40, the second wall 20 and third wall 22 being on opposite sides of the first wall 18. A fourth wall 24 extends between second wall 20 and

third wall 22. The exterior walls 16 (i.e., first wall 18, second wall 20, third wall 22 and fourth wall 24) together define an interior surface 30 of housing 14, within which an interior area 28 is located. As shown in FIGS. 1 and 2, exterior walls 16 and end walls 40 and 42 may each, if desired, be made of two planar portions. Such construction strengthens housing 14 and is useful in locations where the housing might be vandalized. The outer portions of walls 16 help withstand any blow or impact to housing 14 to prevent its destruction or removal of the housing from its mounting or paper products from the housing.

As shown in FIG. 1, fourth wall 24 includes a door 34 which may be hingedly attached to third wall 22 (or to the second wall 20). The door 34 may form all of or only a portion of the fourth wall 24. Door 34 is openable for insertion of paper products 12 into interior area 28 of housing 14 when the supply of paper products 12 runs low. Door 34 includes a latching mechanism 36 including a number of interfering notched tabs 38 on door 34 and second wall 20 that hold door 34 closed. Tabs 38 on either door 34 or second wall 20 are movable when desired to reopen door 34 by turning a key lock (not shown). The lock may be either located on door 34, in which case the tabs 38 on door 34 are movable, or on the main part of housing 14, in which case the tabs 38

on second wall 20 are movable. Leaf springs 39 may be provided to assist in reopening door 34 upon unlocking. Any other type of latching mechanism for reopenably securing door 34 may be used within the 5 scope of the invention.

It is contemplated that the fourth wall 24 may be fixed and the paper products 12 may be inserted into the interior area 28 of the housing 14 through the second end wall 42. In such case, the second end 10 wall 42 may be fitted with latches, springs and the like. It is also contemplated that the second end wall may be removed entirely and that portion of the housing be left open.

In accordance with the invention, a means is 15 provided for urging paper products 12 within interior area 28 toward dispensing throat 32 in a dispensing direction 44. Various alternatives are possible within the scope of the invention to urge paper products 12 toward dispensing throat 32 in 20 dispensing direction 44.

For example, as shown in FIGS. 1 and 2, an attachment portion 46 of housing 14 may be provided for attaching housing 14 to a substantially nonhorizontal surface such as vertical wall 48. As 25 shown in FIG. 2, attachment portion 46 may define holes through first wall 18 of housing 14 for receiving attachment members (not shown) such as screws, bolts, nails, etc. for attaching housing 14

to wall 48. Alternately, a mounting bracket could be formed on an exterior surface of first wall 18 for contacting and being supported by another bracket, screws, bolts, nails, etc. extending from wall 48. Further, housing 14 could be secured to wall 48 via a glue, epoxy, etc., or any other type of adhesive. Also, it would be possible to locate attachment portion 46 on any part of housing 14, such as second wall 20, third wall 22, first end 40, or second end 42, and to use combinations of mounting devices on several of the above-identified parts of housing 14. Further, housing 14 could simply be positioned such that first end 40 is lower than second end 42, and so that first end 40 and possibly first wall 18 are supported in some way without fixing housing 14 to any particular structure.

Thus, the means for urging paper products 14 toward dispensing throat 32 in dispensing direction 44 may comprise any structure or orientation, or both, of housing 14 and/or wall 48 that allows paper products 12 to be dispensed from dispensing throat 32 and to be urged in dispensing direction 44 by gravity. A second type of a mechanism for urging paper products 12 toward dispensing throat 32 in dispensing direction 44 will be discussed below in relation to a second embodiment (110) of container 10.

In accordance with the invention, at least one protrusion, referred to generally as 50, extends from interior surface 30 on at least one of exterior walls 16 into interior area 28 of housing 14.

5 Preferably, as shown in FIG. 2, second wall 20 and third wall 22 include protrusions 50 extending into interior area 28. Protrusions 50 preferably comprise curved bumpers 52, which may include a plurality of ridges 54 extending across the curved bumpers perpendicular to dispensing direction 44.

10 As shown best in FIG. 2, bumpers 52 extend into interior area 28 to contact paper products 12 and thereby oppose the means for urging paper products 12 in dispensing direction 44. By extending into interior area 28 to contact paper products 12, bumpers 52 impede the movement of paper products 12 toward dispensing throat 32, but do not prohibit such movement. Ridges 54 allow numerous paper products 12 to be contacted by an individual bumper and allow for a smoother movement of paper products through housing 14. In embodiments where the means for urging paper products 12 in dispensing direction 44 includes mounting housing 14 so that gravity causes such movement, protrusions 50 also support paper products 12 against the force of gravity. Protrusions 50 therefore reduce the gravitational force of the bottom of the paper products 12 on dispensing throat 32, thereby making it easier for a

user to remove individual paper products from dispensing throat 32.

FIG. 3 shows a preferred profile of one of the bumpers 52. As shown, the exterior curve of bumper 5 5 is defined by a radius  $r$  of from about 1.125 to 1.750 in. The bumper has a chordal length  $l$  of from about 1.625 to 1.875 in. Two ridges 54 each have a radius of from about 0.125 to 0.250 in., and their centers are each spaced about 0.250 in. from the 10 center of bumper 52. While the disclosed bumper shape is the currently preferred shape, other shapes could be used if desired.

In accordance with the invention, protrusions 50 on second wall 20 are desirably staggered from 15 protrusions 50 on third wall 22 relative to dispensing direction 44. Such staggering provides a smooth movement of paper products 12 along dispensing direction 44 and out dispensing throat 32. Paper products 12, being supported alternately 20 on one side or the other by the staggered protrusions 50, "walk" down housing 14 in dispensing direction 44 and out dispensing throat 32.

Staggering protrusions 50 in dispensing direction 44 is important in embodiments where paper products 12 25 are moved in dispensing direction 44 due to the mounting or orientation of housing 14 by gravity. For example, if protrusions 50 were spaced opposite from each other on second wall 20 and third wall 22,

paper products 12 might be entirely prevented from moving in dispensing direction and thus sit on top of a pair of protrusions 50. Also, paper products 12 might unevenly move in spurts past a pair of non-staggered protrusions 50 which could lead to misaligning of paper products and ultimately jamming of paper products within housing 14. Thus, staggering of protrusions 50 allows an orderly walking of paper products 12 along housing 14 in dispensing direction 44 where first one side of the paper products, and then the other, moves more steadily toward dispensing throat 32.

Preferably, container 10 includes a second group of protrusions 50 extending from first wall 18 and fourth wall 24 into interior area 28 to contact paper products 12. The second group of protrusions 50 is preferably disposed in a staging area 56 near dispensing throat 32 for spacing, slowing, aligning and supporting paper products 12 as they are moved in dispensing direction 44 through dispensing throat 32. Preferably, the second group of protrusions 50 includes several rib members 58 extending parallel to dispensing direction 44 on both sides of the dispensing throat 32 as shown in FIG. 4A. Rib members 58 may have different dimensions to properly support and guide the paper products 12 into the dispensing throat 32 as illustrated in FIG. 4B. In particular, a tall rib member 59 which is adjacent

first wall 18 and first end wall 40 extends into the interior area 28 by a greater amount than short rib member 60. Tall rib member 59 is illustrated to show an exemplary sloping configuration and an optional radius of curvature. As can be seen in FIG. 4B, a top surface 62 of the tall rib member 59 closest to the dispensing throat 32 may be offset from the first end wall 40. The short rib member 60 is adjacent the fourth wall 24 and the first end wall 40. The short rib member 60 is illustrated to show an exemplary sloping configuration. As illustrated in FIG. 4B, a top surface 64 of the short rib member 60 may be configured so there is no offset from the first end wall 40.

Generally speaking, the tall rib member 59 may have a height ranging from about 1 to about 2 inches at the location where it intersects with the first wall 18 and an offset or height ranging from about 0.1 to about 0.5 inch adjacent the dispensing throat. As an example, the tall rib member 59 may have a height of about 1.5 inch at the location where it intersects with the first wall 18 and an offset or height of about 0.25 inch adjacent the dispensing throat.

The short rib member 60 may have a height ranging from about 0.5 to about 1.5 inch at the location where it intersects with the fourth wall 24 and an offset or height ranging from 0 to about 0.24

inch adjacent the dispensing throat. As an example, the short rib member 60 may have a height of about 0.75 inch at the location where it intersects with the fourth wall 28 and no offset or height adjacent the dispensing throat. However, it should be understood that the dimensions of these rib members may be varied to accommodate a variety of factors including, but not limited to, the size of the paper product, basis weight of the paper product, composition/texture of the paper product, fold pattern of the paper product, height of the stack of paper products, force supplied by the means to urge the paper products to the dispensing throat, amount and dimensions of protrusions located on the second and third walls of the container as well as amount of other rib members positioned proximate the dispensing throat.

FIG. 4C is a sectional view taken along line 3-3 in FIG. 4B showing a portion of an exemplary tall rib member 59. FIG. 4D is a sectional view taken along line 4-4 in FIG. 4B showing a portion of an exemplary short rib member 60. The rib members may have various widths or thicknesses and the width of a rib member may vary along any dimension or dimensions. Desirably, the portion of the rib member contacting the paper product will be relatively thin and smooth to minimize friction.

FIG. 4E is a view from the interior of a container for dispensing papers looking out through the dispensing throat 32 and illustrating a top view of exemplary rib members 58.

5 In embodiments of the invention such as, for example, where the dispensing throat is located in an exterior wall, the staging area may be alternatively and/or additionally configured with at least one of a different type of rib member  
10 extending parallel to the dispensing direction and having a number of teeth extending from the rib member for contacting the paper products and opposing the mechanism for urging.

Housing 14 may be made of injection-molded  
15 plastic such as polyethylene or nylon. However, other suitable materials, such as other plastics or metals, may be provided for any or all of the parts of housing 14. Curved bumpers 52 and rib members 58 are preferably formed integral with housing 14.  
20 However, curved bumpers 52 and rib members 58 may be formed separately from housing 14 and attached later. Also, curved bumpers 52 and rib member 58 may be made of different material from housing 14 if desired. For example, curved bumpers 52 and/or rib  
25 members may be made of a more resilient material than the materials described above, such as an elastomer or rubber.

While curved bumpers 52 have been described as disposed on second and third walls 20 and 22, which are side walls in FIGS. 1 and 2 where housing 14 is mounted to wall 48, curved bumpers 52 could be 5 disposed on any pair of opposite walls of housing 14. Also, although rib member or members 58 have been described as disposed on first and fourth wall 18 and 24, which are front and back walls in FIGS. 1 and 2, rib member or members 58 could be disposed on 10 any wall or pair of opposite walls of housing.

Preferably, curved bumpers 52 are disposed on one such pair of walls and rib member or members 58 are disposed on one or both of a different pair of side walls located 90° from those on which curved bumpers 15 52 are located.

Dispensing throat 32 may have many shapes within the scope of the present invention, as long as the throat provides easy access for a user and metered delivery of individual paper products.

20 Preferably, paper products 12 are interfolded or tab interfolded to provide metered feeding of individual napkins one at a time. However, the present invention does not require the use of interfolded paper products.

25 Housing 14 may hold multiple clips of paper products 14, as shown in FIG. 5., and may extend from 30 to as much as 48 in. from end to end.

Preferably, first wall 18 is angled between 0-5

from the vertical to prevent paper products from falling out of housing 14 during refilling.

A second embodiment of the present invention is shown in FIG. 6, which discloses a container 110 similar to container 10 in most ways. Container 110 includes a housing 114 holding paper products 112 and including exterior walls 116. The paper products 112 are dispensed in a dispensing direction 144 through a dispensing throat 132. At least one protrusion 150 extends from interior surface 130 into interior area 128 to contact paper products 112.

Protrusions 150 include curved bumpers 152 including ridges 154 similar to those discussed above in connection with the first embodiment of the invention. Curved bumpers 152 are staggered in dispensing direction 144 as discussed above. A staging area 156 is provided adjacent dispensing throat 132 at first end 140 of housing 114. Staging area 156 includes additional curved bumpers 153 not staggered in dispensing direction 144. Bumpers 153 allow paper products 112 to bow at the middle toward dispensing throat 132 to make it easier for a user to remove a single paper product from dispensing throat 132.

In container 110, the means for urging paper products 112 from interior area 128 toward dispensing throat 132 in dispensing direction 144 is

different from that of container 10. As shown in FIG. 6, a spring-loaded plate 155 is disposed within second end 142 of housing 114 along with at least one spring 157. When spring 157 is compressed by spring-loaded plate 155, spring 157 urges spring-loaded plate 155 in dispensing direction 144. Thus, when paper products 112 are placed in container 110 and spring-loaded plate is pushed to the right (as shown in FIG. 6) thereby compressing spring 157, spring-loaded plate 155 and spring 157 urge paper products 112 in dispensing direction 144 toward dispensing throat 132. Use of a spring-loaded plate and spring mechanism allows container 110 to be used in situations where dispensing direction 144 is substantially horizontal. Thus, container 110, which provides spring-loaded urging, can be used in locations where container 10, which provides gravity-assisted urging, could not. It should be understood that the staging bumpers 153 of container 110 could be replaced with rib members similar to those used with container 10 shown in FIG. 1 and as depicted, for example in FIG. 4A through FIG. 4E.

In accordance with the third embodiment of the present invention, a container 210 is provided for holding paper products 212 to be dispensed to a user. As shown in FIGS. 7-9, container 210 includes a housing 214 defined by exterior walls 216, including first wall 218, second wall 220, third

wall 222, and fourth wall 224. Exterior walls 216 define an interior surface 230, within which is disposed an interior area 228. A dispensing throat 232 is provided through first end wall 240 which is positioned opposite a second end wall 242. Paper products 212 are dispensed in a dispensing direction 244 through dispensing throat 232. Housing 214 includes plurality of protrusions 250, including curved bumpers 252 having ridges 254 and rib members 258 disposed in a staging area 256.

However, housing 214 need not include a door, as found in some other embodiments of the invention, although a door may be provided for security reasons. In this embodiment, the fourth wall 224 is quite small and located near the dispensing opening 232 in the first end wall 240 leaving a face of the container 210 substantially open. Further, housing 214 can also be constructed with double walls, as in housing 14, for security reasons. Also, paper products 212 are not directly loaded into interior area 228, as in the first and second embodiments.

As shown in FIG. 8A, a cartridge 262 is provided for insertion into interior area 228 of housing 214 for containing paper products 212 to be dispensed. As shown in FIG. 7, cartridge 262 is sized to fit snugly within interior area 228 of housing 214. If desired, leaf springs 264 may be provided attached to the inside of second end 242 of

housing 214 to hold cartridge 262 in place. Any other suitable mechanism such as a tab or other interlock may be used to hold cartridge 262 in housing 214 within the scope of the invention.

5 Preferably, cartridge 262 includes a plurality of removable portions 268, the removal of which creates openings 270 through cartridge 262. As shown in FIG. 8A, cartridge 262 includes a plurality of removable portions 268 that create openings 270 upon removal. Removable portions 268 are disposed in outside walls 272 of cartridge 262 so that, once removable portions 268 are removed, openings 270 encompass and receive protrusions 250 extending from interior surface 230 of housing 214. Thus, upon 10 removal of removable portions 268 and placement of cartridge 262 in housing 214, curved bumpers 252 and rib members 258 contact the paper products 212 within cartridge and act just as the bumpers and rib members do in the first two embodiments of the 15 invention.

20

Cartridge 262 may also include another removable portion 278 disposed at end 280 of cartridge 262. Removable portion 278 may be removed to receive a spring-loaded plate if cartridge 262 is 25 to be used in a container such as that shown in FIG. 6 with a spring-loaded plate.

As shown in FIG. 8A, a removable portion 274 may be provided at end 276 of cartridge 262 so that

paper products 212 can be supported and aligned by rib member 258 for dispensing through dispensing throat 232. Alternately, end 276 of cartridge 262 may be formed as shown in FIG. 8B, so that removable portion 274 is not required and cartridge 262 fits into housing 214 without substantial modification of end 276. Thus, if desired, a plurality of smaller removable portions 274a (see FIG. 8B) may be provided corresponding to rib members 258 and a smaller removable portion 274b may be provided corresponding to dispensing throat 232.

Removable portions 268, 278, and 274a may either be removed (or simply not formed) during manufacture of cartridge 262 or removed during installation of cartridge 262 in housing 214. If removable portions 268, 278, and 274a are to be removed as part of the manufacturing process, cartridge 262 should be shipped to the user wrapped, for example in a polyethylene bag, to preserve the sterility of the paper products in the cartridge. If removable portions 268, 278, and 274a are to be removed as part of the installation process, the edges of the removable portions should be weakened, scored, etc. for easy removal. Removable portion 274 should not be removed as part of the manufacturing process to ensure that paper products 12 remain properly loaded in cartridge 262.

Optional removable portions 268 may be placed on front wall 272 (and/or a back wall which is not shown) of cartridge 262. Removable portions 268 may be used if optional protrusions 258 (i.e., rib members of the type shown in FIGS. 4A-4E) are used on the first wall 218 and the fourth wall 224 of housing 214 (see, for example, FIG. 7). Such protrusions or rib members 258 may also be used on the first wall 18 and the fourth wall 24 of first embodiment housing 14, if desired.

Preferably, cartridge 262 includes at least one slot 282 extending through one of the cartridge walls 272. Slot 282 is visible from outside of housing 214 when cartridge 262 is mounted in interior area 228. A user can visually determine the amount of paper products 212 remaining within cartridge 262 by inspecting the amount of paper products visible through slot 282. As shown in FIG. 8A, two slots may be provided to provide a greater range of visual inspection. Any number or arrangement of slots is possible within the scope of the invention.

Cartridge 262 is preferably made of heavy paper or cardboard, but may be made of any other suitable material within the scope of the invention.

FIG. 10 is a partial perspective view of another exemplary container for dispensing paper products in which the dispensing throat 32 is

located on the fourth wall 24 above the first end wall 40 and below the portion of the fourth wall 24 that forms the door 34.

FIG. 11 is a perspective view of a housing of another exemplary container similar to the one shown in FIG. 7 except that the dispensing throat 232 is located in the fourth wall 224 above the first end wall 240 and below the open face of the container. Another feature which may be seen in FIG. 11 and which is hidden from view in FIG. 10 is the exemplary protruding rib members 400 extending parallel to the dispensing direction 244 and having a plurality of teeth 402 to contact paper products. These protruding rib members 400 may be located proximate the dispensing throat 232 on any of the exterior walls and are desirably located on one or more of the first wall 218 and/or the fourth wall 224. It is desirable for a pair of these rib members 400 to be located in parallel on each wall.

FIG. 12 is a sectional view of an exemplary rib member 400 with a plurality of teeth 402 to contact paper products 412 proximate the dispensing throat. The rib member is shown attached to the first wall 218 which is depicted as attached to a substantially vertical surface 448. The teeth 402 desirably extend from about 0.250 inch to about 0.500 inch measured perpendicular to the dispensing direction 244.

FIG. 13 is a perspective view of another exemplary cartridge 262 which is configured for use with the exemplary containers of FIGS. 10 and 11. It can be seen from the illustration that alternative 5 and/or additional removable portions 268' and alternative and/or additional openings 270' are located in the back and the front of the outside walls 272 of the cartridge 262. A removable portion 274' may be formed at the end 276' of the cartridge 10 262 so that paper products 212 can be dispensed through the dispensing throat 232 positioned in the fourth wall 224 as shown in FIGS. 10 and 11.

FIG. 14 is a partial perspective view showing another embodiment of the cartridge of FIG. 13. In particular, FIG. 14 depicts an alternative 15 configuration for the end 276' of the cartridge 262 having a removable portion 274' which is intended to conform to an embodiment in which the dispensing throat 232 positioned in the fourth wall 224 as 20 shown in FIGS. 10 and 11.

FIG. 15 is a perspective view of another exemplary embodiment showing a cartridge placed in the exemplary housing shown in FIG. 11.

FIG. 16 is a perspective view of a housing of 25 an exemplary container for dispensing individual paper products from a cartridge holding a plurality of paper products. The container shown in FIG. 16 is generally similar to the ones shown in FIGS. 7 and

11 and, for the ease of identification, most of the  
same identifying reference numbers will be used. An  
important distinction between the container shown in  
FIG. 16 and the other containers is that the housing  
5 of the container lacks a dispensing throat. Another  
feature which may be seen in FIG. 16 is the fully  
open face of the dispenser which includes one or  
more cartridge retaining means 900 which may be  
affixed to the end wall 240 and/or exterior walls  
10 220 and 230.

The cartridge retaining means 900 may be small  
blocks, chucks, stops, wires, braces, brackets,  
pins, clips or the like as well as combinations  
thereof. Alternatively and/or additionally, it is  
15 contemplated that other devices such as hooks,  
clamps or the like, adhesive materials, or  
interlocking or interacting container and cartridge  
geometries may be used as cartridge retaining  
means. The position of these means may be in the  
20 interior of the container and the illustration of  
the means at the exterior is not intended to be  
limiting.

A thumb notch 902 may be located in the first  
end wall 240 along the dispensing direction 244. The  
25 thumb notch may be configured in any shape or size  
that is appropriate for the dimensions of the  
dispenser and the product to be dispensed.  
Desirably, the thumb notch will have dimensions that

are compatible with the dimensions of any finger or thumb notches in any cartridges containing paper products used with the container.

FIG. 17 is another exemplary container for dispensing individual paper products from a cartridge holding a plurality of paper products. The container shown in FIG. 17 is generally similar to the one shown in FIG. 16. It can be seen that the housing depicted in FIG. 17 has a plurality of protrusions, including curved bumpers 252 which may include ridges, and rib members 258 located in a staging area 256.

If protrusions in the form of curved bumpers are used, they may extend from the second and third exterior walls into the interior area. If protrusions in the form of rib members are used, they may generally be configured as shown in FIG. 17 and can desirably be arranged in the manner of the tall rib members in FIGS. 4A and 4B.

It is contemplated that a fourth exterior wall may be included on the container. For example, an optional fourth wall 224 may be included in the container as shown in FIG. 18. The fourth wall 224 may partially cover the front of the housing and may function as a cartridge containing means. Although the fourth wall 224 is shown intersecting or contacting the first end wall 240, the fourth wall 224 may be separated from the first end wall and

appear as a band or strip or wall connecting the second wall 220 and the third wall 222.

Alternatively and/or additionally, the optional fourth wall 224 may have a fixed portion and a 5 hinged portion that may function as a door. If an optional fourth wall 224 is used, a dispensing throat 232 may be provided at the intersection of the fourth wall 224 and the first end wall 240. In such an embodiment, paper products 212 are dispensed 10 in a dispensing direction 244 through the dispensing throat 232. As shown in FIG. 18, the fourth wall 224 may be quite small and with the first end wall 240 form a dispensing throat 232 leaving a face of the container 210 substantially open. Further, housing 15 214 can also be constructed with double walls, doors, etc. for security reasons.

In embodiments utilizing a dispensing throat 232 defined by the intersection of the fourth wall 224 and the first end wall 240, the dispensing 20 throat 232 is desirably sized so that it has a horizontal dimension "H" that is about the same as or slightly greater than the width of the paper products within the cartridge and a vertical dimension "V" that is large enough to permit the 25 passage of a limited number of paper products. Of course, the cartridge 262 will need to be configured to cooperate with the dispensing throat. Generally speaking, if the paper products are in the form of

folded paper napkins, the vertical dimension "V" of the dispensing throat may be sized so that a limited number of folded paper napkins may extracted. This could be achieved by making the vertical dimension 5 "V" some multiple of the thickness of an individual folded paper napkin (e.g., desirably greater than about 2 and less than about 10 thicknesses, even more desirably greater than about 2 and less than about 6 thicknesses).

10 The paper product may be accessed by a thumb slot and/or a finger slot. Desirably, these slots are located on the fourth wall 224 and the first end wall 240 and may be centered with respect to the dimensions of the housing or the dimensions of the 15 dispensing throat 232.

FIG. 19 is a perspective view of another exemplary cartridge 262 which is configured for use with the exemplary containers of FIGS. 16 and 17. Generally speaking, the cartridge may similar to the 20 cartridges shown in FIGS. 8A and 13 and may include a cartridge body having cartridge walls and may further include removable sections defined in the cartridge body generally as described above for the other cartridge embodiments. Since the container 25 embodiments of FIGS. 16 and 17 described above may have an open face rather than a dispensing throat, the cartridge front wall 272a intended to be positioned in the open face of the container should

include a slit, slot, orifice or channel 950 that can serve to control access to the paper products held within. Desirably, the slot is defined by the cartridge front wall 272a and the bottom wall 272b of the cartridge. However, it is contemplated that other locations may be used.

The slit is desirably sized so that it has a horizontal dimension "H" that is about the same as or slightly greater than the width of the paper products within the cartridge and a vertical dimension "V" that is large enough to permit the passage of a limited number of paper products. For example, if the paper products are in the form of folded paper napkins, the vertical dimension "V" of the slit may be sized so that a limited number of folded paper napkins may be extracted. This could be achieved by making the vertical dimension "V" some multiple of the thickness of an individual folded paper napkin (e.g., desirably greater than about 2 and less than about 10 thicknesses, even more desirably greater than about 2 and less than about 6 thicknesses).

The paper product may be accessed by a thumb slot 952 and/or a finger slot 954. Desirably, these slots are located on the front and bottom faces of the cartridge and may be centered with respect to the dimensions of the cartridge or the dimensions of the slot.

The cartridge may define at least one additional slot 282 through one of the cartridge walls, the slot being visible from outside the housing when the cartridge is in the interior area of the housing, an amount of paper products disposed within the cartridge being determinable by visually inspecting the amount of paper products through the slot.

FIG. 20 is a perspective view of another exemplary embodiment showing an exemplary cartridge 262 as depicted in FIG. 19 inserted in place in an exemplary housing as shown in FIGS. 16 or 17. A dispensing direction "D" is identified as generally perpendicular to the housing and cartridge assembly. If the paper product is, for example, an interfolded paper napkin or tissue, a leading flap or tail 960 would extend out of the slot 950 and be available for a user to grasp.

FIG. 21 is yet another embodiment of an exemplary housing. This embodiment differs from the embodiments shown in FIGS. 16 and 17 in that the first end wall 240 of FIGS. 16 and 17 generally slopes away from the front or open face of the housing. In contrast, the first end wall 240 of FIG. 21 slopes into or opens up to the front or open face of the housing.

FIG. 22 is an exemplary cartridge which is intended to be inserted into the housing shown in

FIG. 21. The cartridge front wall 272a and the bottom wall 272b are configured to fit snugly in the housing.

5 FIG. 23 is an enlarged cross-sectional view (not to scale) of the lower portion of the container and cartridge assembly shown in FIG. 20. The cartridge front wall 272a, the bottom wall 272b and a back wall 272c and a stack of interfolded paper product 212 is shown. As can be seen in the 10 enlarged and expanded view, the slot 950 has a vertical dimension "V" which is generally some multiple of the thickness of a single layer or ply or fold of the paper product 212. A dispensing direction "D" is identified as generally perpendicular to the housing and cartridge assembly. 15 If the paper product is, for example, an interfolded paper napkin or tissue, a leading flap or tail 960 can be seen extending out of the slot 950 for a user to grasp. Pulling the leading flap 960 will 20 result in one-at-a-time dispensing of the product.

It should be understood that FIG. 23 may also generally represent an enlarged cross-sectional view (not to scale) of the lower portion of the container assembly shown in FIG. 18 when combined with a 25 cartridge or a clip of paper products. The cartridge front wall 272a may be read as corresponding to the fourth wall 224, the bottom wall 272b corresponding to the first end wall 240, the back wall 272c

corresponding to the first wall 218, the slot 950 corresponding to the dispensing throat 232, and the finger and thumb slots in the cartridge  
corresponding to finger and thumb slots in the  
5 fourth wall 224 and the first end wall 240. Of course, the cartridge may be configured as shown in FIGS. 8A, 13 and/or 19 to cooperate with the dispensing throat 232 defined by the intersection of the fourth wall 224 and the first end wall 240.  
10 Thus, the following description applies to embodiments of the invention having a generally open face with a dispensing slit in the cartridge(i.e., lacking a dispensing throat in the housing) as well as embodiments with a dispensing throat 232 defined  
15 by the intersection of the fourth wall 224 and the first end wall 240.

Gripping the interfolded product between lower grip point 1000 and a first upper grip point 1002 engages two of the interfolded paper products (e.g., napkins, tissues, wipes, etc.) for dispensing. One of which has a visible tail 960 extending from the slot 950 and the other tail 962 still located inside the cartridge but accessible through the finger slot 954. Pulling the product engaged at grip points 1000 and 1002 in the dispensing direction "D" will result in two of the interfolded paper products to be dispensed at a time. This result will be consistent provided the interfolding of the product is

consistent and the grip areas 1000 and 1002 remain accessible.

5 Pulling the product engaged at grip points 1000 and 1004 in the dispensing direction "D" will result in four of the interfolded paper products to be dispensed at a time. This result will be consistent provided the interfolding of the product is consistent and the grip areas 1000 and 1004 remains accessible.

10 Pulling the product engaged at grip points 1000 and 1006 in the dispensing direction "D" will result in six of the interfolded paper products to be dispensed at a time. This result will be consistent provided the interfolding of the product is consistent and the grip areas 1000 and 1006 remains accessible. Grip area 1006 may be accessed through thumb slot 952. For interfolded products having visible forward folds "F<sub>f</sub>", this can be described mathematically for interfolded products as  $N = F_f \times 2$  where N = the number of products dispensed, F<sub>f</sub> = the number of forward folds "F<sub>f</sub>" falling between the identified grip points and which are gripped by the user. The number of forward folds (F<sub>f</sub>) available for gripping is generally limited only by the vertical dimension of the slot "V" and the size of the finger slots. Generally speaking, the "stack" of product dispensed will be in a folded configuration except for the leading and trailing edge or flap. Of

course, if the product is dispensed one-at-a-time, it will be in an unfolded configuration.

If a non-interfolded product is used in the cartridge, the dispensing direction "D" remains the same. However, there will be no leading flap as in the interfolded format. Generally speaking, the number of products dispensed will be the same as the number of forward folds gripped unless the product is double or triple folded.

It will be apparent to those skilled in the art that various modifications and variations can be made in the present invention without departing from the scope and spirit of the invention. It is intended that the present invention include such modifications and variations as come within the scope of the appended claims and their equivalents.

We Claim:

1. A container for dispensing individual paper products, the container comprising:

a housing including a plurality of exterior walls defining an interior surface and an interior area within the interior surface for receiving a plurality of the paper products, a first end wall defining a dispensing throat for permitting removal of paper products from the interior area, means for urging paper products within the interior area toward the dispensing throat in a dispensing direction, a first, second and third of the exterior walls intersecting the first end wall on opposite sides of the first exterior wall and forming a portion of the interior surface, protrusions extending from the portion of the interior surface on the second and third exterior walls into the interior area for contacting the paper products to oppose the means for urging, the protrusions on the second wall being staggered from the protrusions on the third wall in the dispensing direction.

2. The container of claim 1, wherein the means for urging includes a spring-loaded plate disposed in the interior area of the housing for urging the paper products in the dispensing direction.

3. The container of claim 2, wherein the dispensing direction is substantially horizontal.

4. The container of claim 1, wherein the means for urging includes an attachment portion of the housing for attaching the housing to a substantially nonhorizontal surface, the paper products being urged in the dispensing direction by gravity.

5 5. The container of claim 4, wherein the dispensing direction is substantially vertical.

10 6. The container of claim 1, wherein the protrusions include curved bumpers.

7. The container of claim 6, wherein the curved bumpers include a plurality of ridges extending across the curved bumpers perpendicular to the dispensing direction.

15 8. The container of claim 1, the housing further including a staging area proximate the dispensing throat for spacing and slowing the paper products. 9. The container of claim 8, wherein the staging area includes rib members extending parallel to the dispensing direction for contacting the paper products and opposing the means for urging.

20 25 10. The container of claim 1, wherein a given one of the exterior walls is a door hingedly attached to the housing, the door being openable for insertion of the plurality of paper products into the interior area.

11. The container of claim 1, further including a cartridge for insertion into the

interior area of housing for containing the plurality of paper products.

12. The container of claim 11, wherein the cartridge includes removable portions, removal of 5 the removable portions creating openings in the cartridge.

13. The container of claim 12, wherein at least one of the openings in the cartridge is disposed adjacent at least one of the protrusions so 10 that the protrusion extends through the opening to contact the plurality of paper products.

14. The container of claim 12, wherein rib members are provided in the interior area of the housing proximate the dispensing throat and at least 15 a portion of the openings in the cartridge being disposed adjacent the rib members so that the rib members extend through the openings to contact the plurality of paper products.

15. A container for dispensing individual 20 paper products, the container comprising:

a housing including a plurality of exterior walls defining an interior surface and an interior area within the interior surface for receiving a plurality of the paper products, a first end wall intersecting the exterior walls defining a dispensing throat for permitting removal of paper products from the interior area, means for urging 25 paper products within the interior area toward the

dispensing throat in a dispensing direction, at least one protrusion extending from the interior surface into the interior area of the housing;

5       a cartridge for insertion into the interior area of the housing for containing the plurality of paper products, the cartridge including at least one removable portion, removal of the removable portion creating an opening in the cartridge, the opening in the cartridge being disposed adjacent the protrusion so that the protrusion extends through the opening to contact the plurality of paper products to oppose the means for urging when the cartridge is placed in 10 the interior area of the housing.

15       16. The container of claim 15, wherein the cartridge includes a second removable portion, removal of the second removable portion creating a second opening in the cartridge, and wherein the means for urging includes a spring-loaded plate disposed in the interior area of the housing and extending through the second opening for urging the 20 paper products in the dispensing direction.

17. The container of claim 16, wherein the dispensing direction is substantially horizontal.

25       18. The container of claim 15, wherein the means for urging includes an attachment portion of the housing for attaching the housing to a substantially nonhorizontal surface, the paper

products being urged in the dispensing direction by gravity.

19. The container of claim 18, wherein the dispensing direction is substantially vertical.

5       20. The container of claim 15, wherein a first, second and third of the exterior walls intersect the first end wall on opposite sides of the first exterior wall, the at least one protrusion including a plurality of protrusions extending from 10 the second and third exterior walls into the interior area, the protrusions including curved bumpers.

15       21. The container of claim 20, wherein the curved bumpers include a plurality of ridges extending across the curved bumpers perpendicular to the dispensing direction.

20       22. The container of claim 15, further including a staging area proximate the dispensing throat for spacing and slowing the paper products.

25       23. The container of claim 22, wherein the staging area includes rib members extending parallel to the dispensing direction for contacting the paper products and opposing the means for urging.

25       24. A container for dispensing individual paper products, the container comprising:

a housing including a plurality of exterior walls defining an interior area for receiving a plurality of the paper products, a first end wall

defining a dispensing throat for permitting removal  
of paper products from the interior area, means for  
urging paper products within the interior area  
toward the dispensing throat in a dispensing  
5 direction, a first, second and third of the exterior  
walls intersecting the first end wall on opposite  
sides of the first exterior wall, a first group of  
protrusions extending from the second and third  
exterior walls into the interior area, a fourth of  
10 the exterior walls including a door hingedly  
attached to the housing, the door being openable for  
insertion of the plurality of paper products into  
the interior area, a second group of protrusions  
extending from the first wall and the fourth wall  
15 into the interior area and in communication with the  
first end wall, the first and second groups of  
protrusions contacting the paper products to oppose  
the means for urging.

25. The container of claim 24, wherein the  
means for urging includes a spring loaded plate  
disposed in the interior area of the housing for  
urging the paper products in the dispensing  
direction.

26. The container of claim 25, wherein the  
dispensing direction is substantially horizontal.

27. The container of claim 24, wherein the  
means for urging includes an attachment portion of  
the housing for attaching the housing to a

substantially nonhorizontal surface, the paper products being urged in the dispensing direction by gravity.

28. The container of claim 25, wherein the dispensing direction is substantially vertical.  
5

29. The container of claim 24, wherein the first group of protrusions includes curved bumpers.

30. The container of claim 29, wherein the curved bumpers include a plurality of ridges extending across the curved bumpers perpendicular to the dispensing direction.  
10

31. The container of claim 24, wherein the second group of protrusions are rib members disposed in a staging area proximate the dispensing throat for spacing and slowing the paper products.  
15

32. A cartridge for holding and dispensing a plurality of paper products, the cartridge being insertable into an interior area of a container having a housing, the interior area being disposed within an interior surface defined by a plurality of exterior walls, wherein rib members are provided in the interior of the housing proximate a dispensing throat, the cartridge comprising:  
20

a cartridge body including cartridge walls;  
25 removable sections defined in the cartridge body, removal of at least a portion of the removable sections creating openings through at least one of the cartridge walls, the removable sections being

located on the cartridge body so that when the cartridge is placed in the interior area of the housing the rib members extend through at least a portion of the openings to contact the plurality of 5 paper products.

33. The cartridge of claim 32, wherein the cartridge walls include two opposing walls and at least two removable sections are provided, each removable section being disposed on one of the 10 cartridge opposing walls.

34. The cartridge of claim 32, wherein the cartridge walls include four cartridge side walls and at least four removable sections are provided, each removable section being disposed on one of the 15 cartridge side walls.

35. A container for dispensing individual paper products, the container comprising:

a housing including a first end wall and a plurality of exterior walls defining an interior surface and an interior area within the interior surface for receiving a plurality of the paper products, a first, second and third of the exterior walls intersecting the first end wall on opposite sides of the first exterior wall and forming a portion of the interior surface,

a fourth exterior wall defining a dispensing throat for permitting removal of paper products from the interior area,

means for urging paper products within the interior area toward the dispensing throat in a dispensing direction,

protrusions extending from the portion of the  
5 interior surface on the second and third exterior walls into the interior area for contacting the paper products to oppose the means for urging, the protrusions on the second wall being staggered from the protrusions on the third wall in the dispensing  
10 direction.

36. The container of claim 35, the housing further including a staging area proximate the dispensing throat for spacing and slowing the paper products.

15 37. The container of claim 36, wherein the staging area includes at least one rib member extending parallel to the dispensing direction and a number of teeth for contacting the paper products and opposing the means for urging.

20 38. The container of claim 35, wherein at least a portion of one of the exterior walls is a door hingedly attached to the housing, the door being openable for insertion of the plurality of paper products into the interior area.

25 39. The container of claim 35, further including a cartridge for insertion into the interior area of housing for containing the plurality of paper products.

40. The container of claim 39, wherein the cartridge includes removable portions, removal of the removable portions creating openings in the cartridge.

5 41. The container of claim 40, wherein at least one of the openings in the cartridge is disposed adjacent at least one of the protrusions so that the protrusion extends through the opening to contact the plurality of paper products.

10 42. The container of claim 40, wherein at least one rib member is provided in the interior area of the housing proximate the dispensing throat, the rib member including teeth extending from the rib member, at least one of the openings in the cartridge being disposed adjacent at least one of the rib members so that the teeth extend through the openings to contact the plurality of paper products.

15 43. A container for dispensing individual paper products from a cartridge holding a plurality of paper products, the container comprising:

20 a housing including a first end wall and a plurality of exterior walls defining an interior surface and an interior area within the interior surface for receiving a cartridge holding a plurality of paper products, a first, second and third of the exterior walls intersecting the first end wall on opposite sides of the first exterior

wall, forming a portion of the interior surface, and defining an open face of the container,

5       a means for urging paper products within the interior area toward the first end wall in a dispensing direction, and  
cartridge retaining means.

44. The container of claim 43, wherein the cartridge retaining means is selected from small blocks, chucks, stops, wires, braces, brackets,  
10      pins, clips and combinations thereof.

45. The container of claim 44, wherein the cartridge retaining means are configured on the first end wall or opposing exterior walls.

15      46. The container of claim 44, further comprising a finger slot in the first end wall.

47. The container of claim 43, the housing further comprising a staging area proximate the first end wall for spacing and slowing the paper products.

20      48. The container of claim 43, further comprising protrusions extending from the portion of the interior surface on the exterior walls into the interior area for contacting the paper products to oppose the means for urging.

25      49. The container of claim 43, further including a cartridge for insertion into the interior area of housing for containing the plurality of paper products.

50. The container of claim 49, wherein the cartridge comprises a cartridge body having cartridge walls.

5 51. The container of claim 50, wherein cartridge includes a cartridge wall for positioning in the open face of the container, the cartridge wall including a slit for controlling access to the paper products held within.

10 52. The container of claim 51, wherein the cartridge is configured so the slit is defined by the front wall and the bottom wall of the cartridge.

15 53. The container of claim 51, wherein the cartridge is configured so the slit is sized to have a horizontal dimension about the same as or slightly greater than the width of the paper products within the cartridge and a vertical dimension that is large enough to permit the passage of a limited number of paper products.

20 54. The container of claim 53, wherein the cartridge is configured so the vertical dimension of the slit is between about 2 and about 10 times the thickness of an individual folded paper product.

25 55. The container of claim 50, wherein the cartridge is configured so the paper products may be accessed by a thumb slot and a finger slot.

56. The container of claim 49, wherein the cartridge includes removable portions, removal of

the removable portions creating openings in the cartridge.

5. 57. The container of claim 56 wherein at least one of the openings in the cartridge is disposed adjacent at least one of the protrusions so that the protrusion extends through the opening to contact the plurality of paper products.

10. 58. A container for dispensing a controlled amount of paper products, the container comprising:

15. 10. a housing including a first end wall and a plurality of exterior walls defining an interior surface and an interior area within the interior surface for receiving a cartridge holding a plurality of paper products, a first, second and third of the exterior walls intersecting the first end wall on opposite sides of the first exterior wall, forming a portion of the interior surface, and defining an open face of the container,

20. 20. a means for urging paper products within the interior area toward the first end wall in a dispensing direction, and

25. 25. a fourth exterior wall that cooperates with the first end wall to define a dispensing throat for controlling access to paper products held within the container.

59. The container of claim 58, wherein the dispensing throat is sized to have a horizontal dimension about the same as or slightly greater than

the width of the paper products within the container and a vertical dimension that is large enough to permit the passage of a limited number of paper products.

5        60. The container of claim 59, wherein the vertical dimension of the dispensing throat is between about 2 and about 10 times the thickness of an individual folded paper product.

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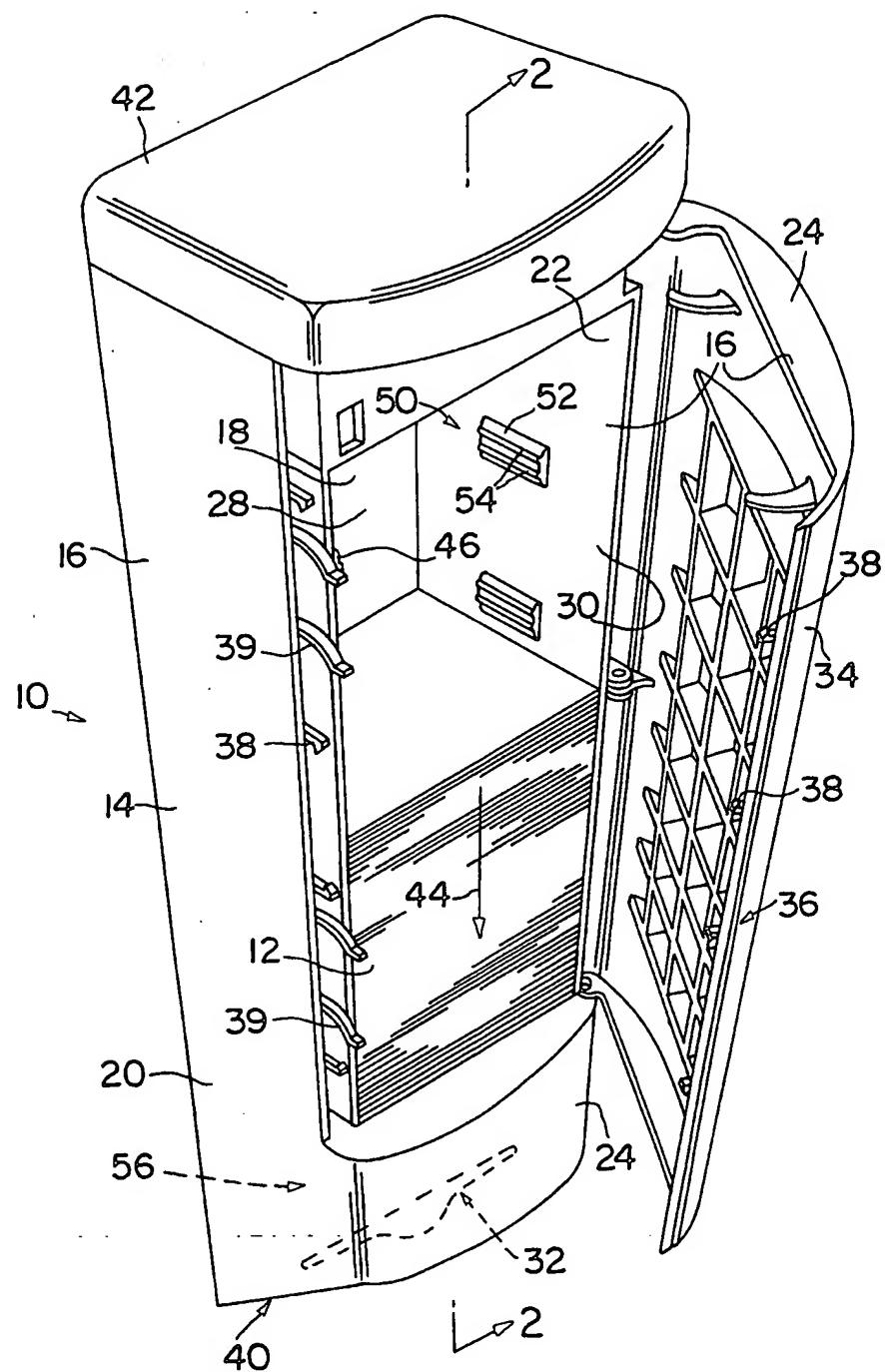


FIG. I

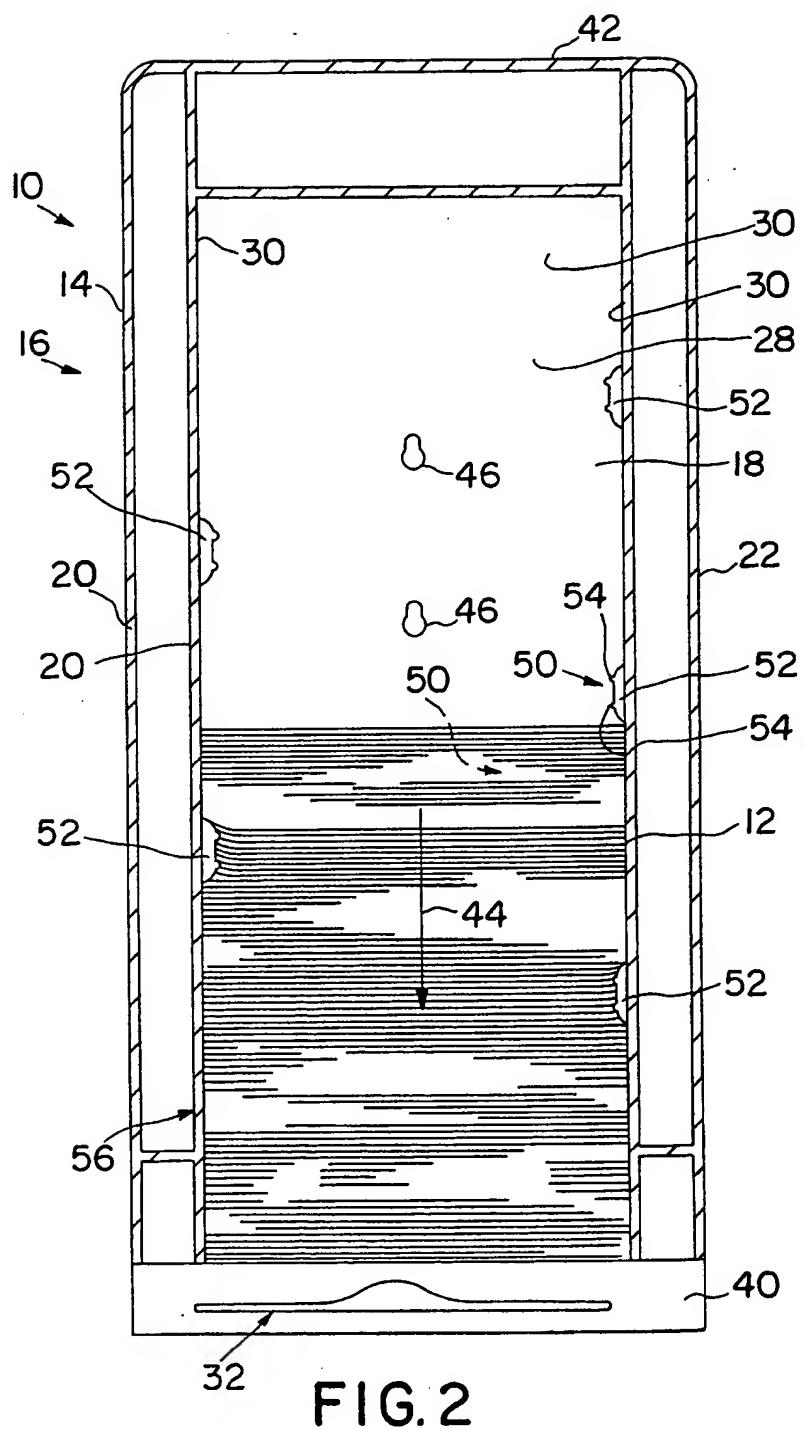


FIG. 2

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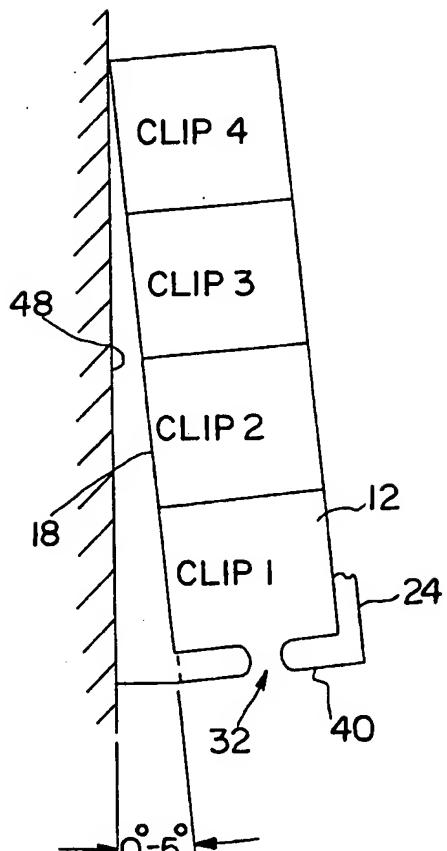


FIG. 5

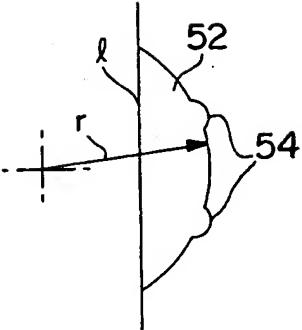


FIG. 3

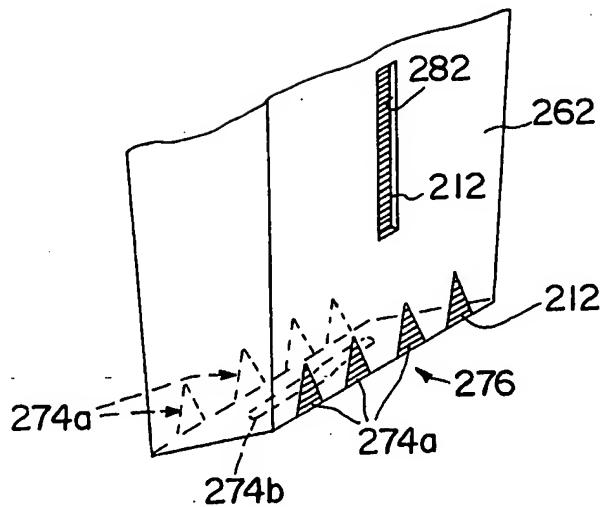


FIG. 8B

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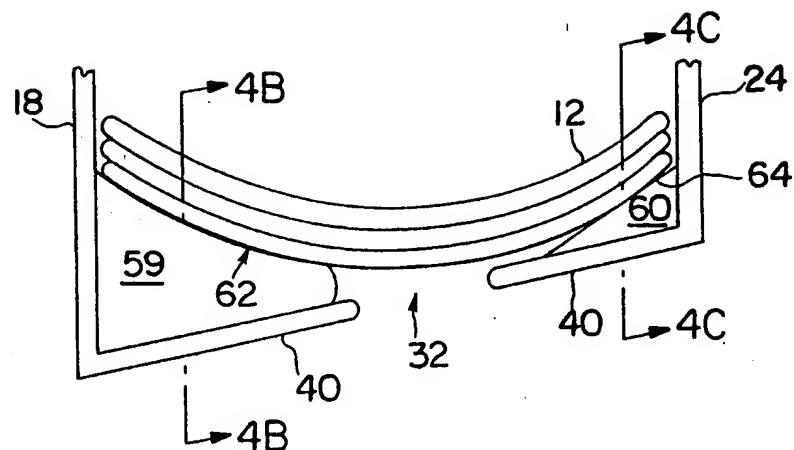


FIG. 4A

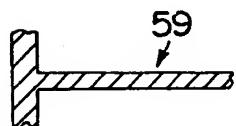


FIG. 4B

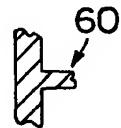


FIG. 4C

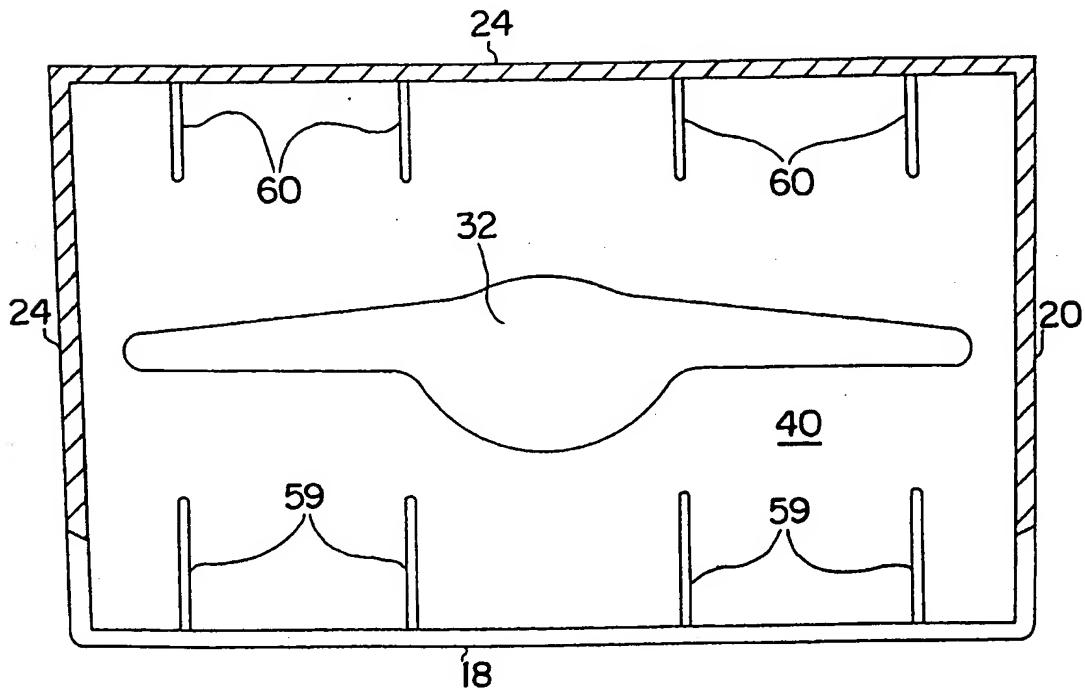


FIG. 4D

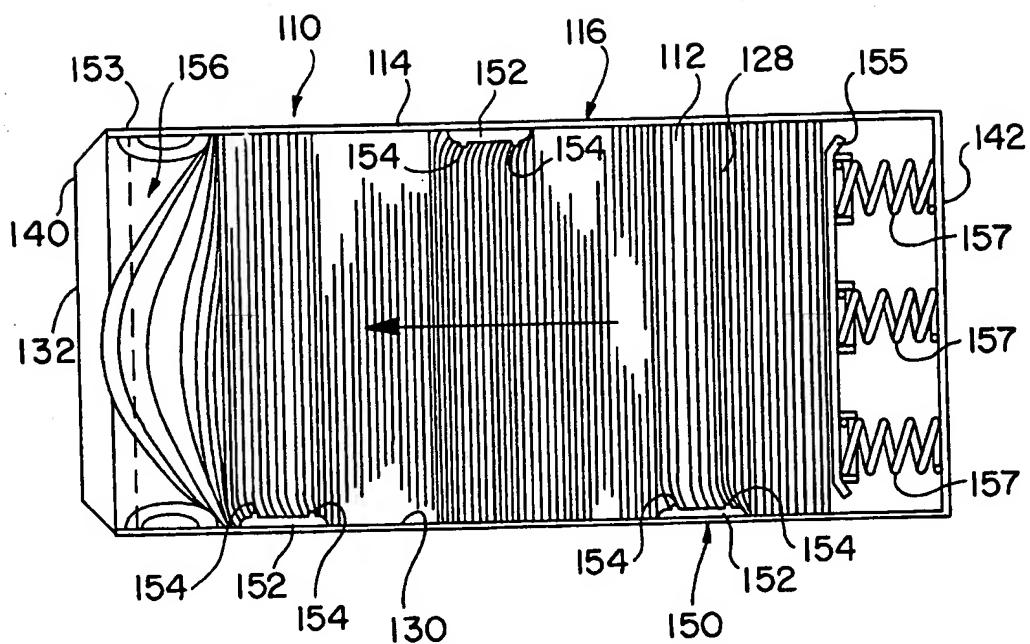


FIG. 6

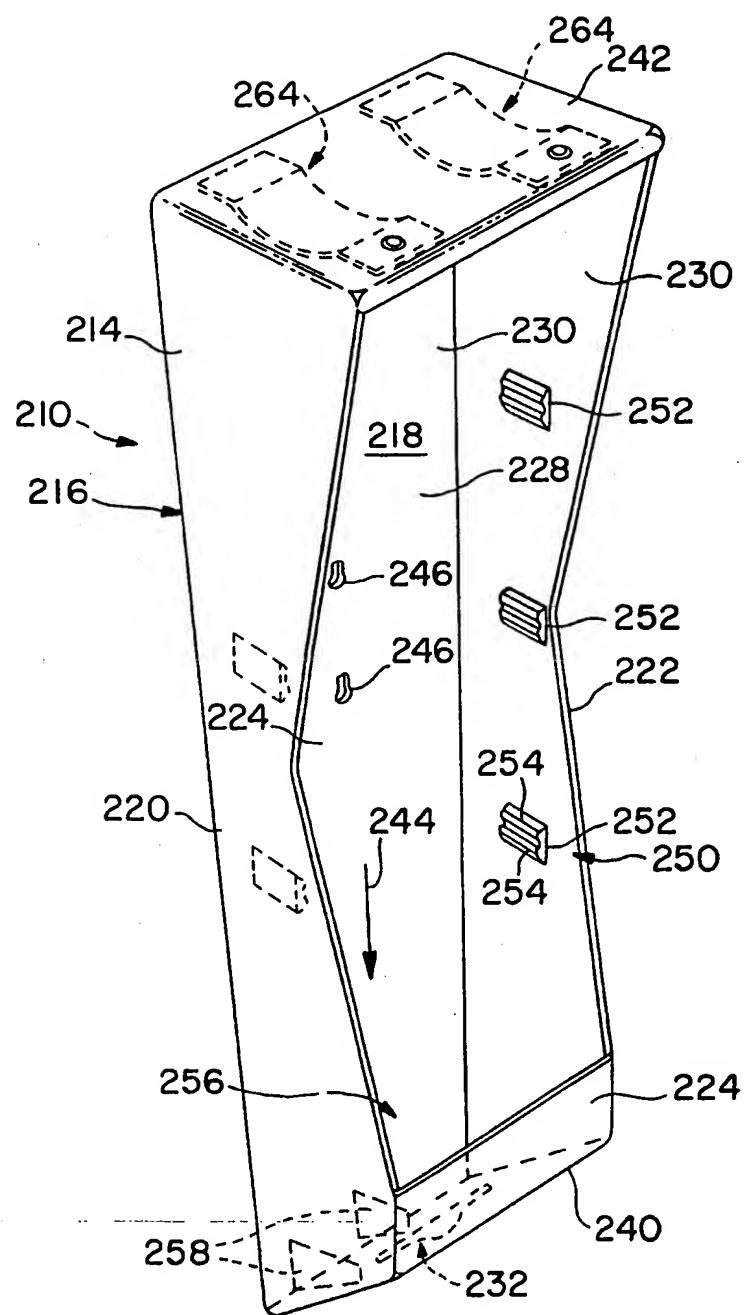


FIG. 7

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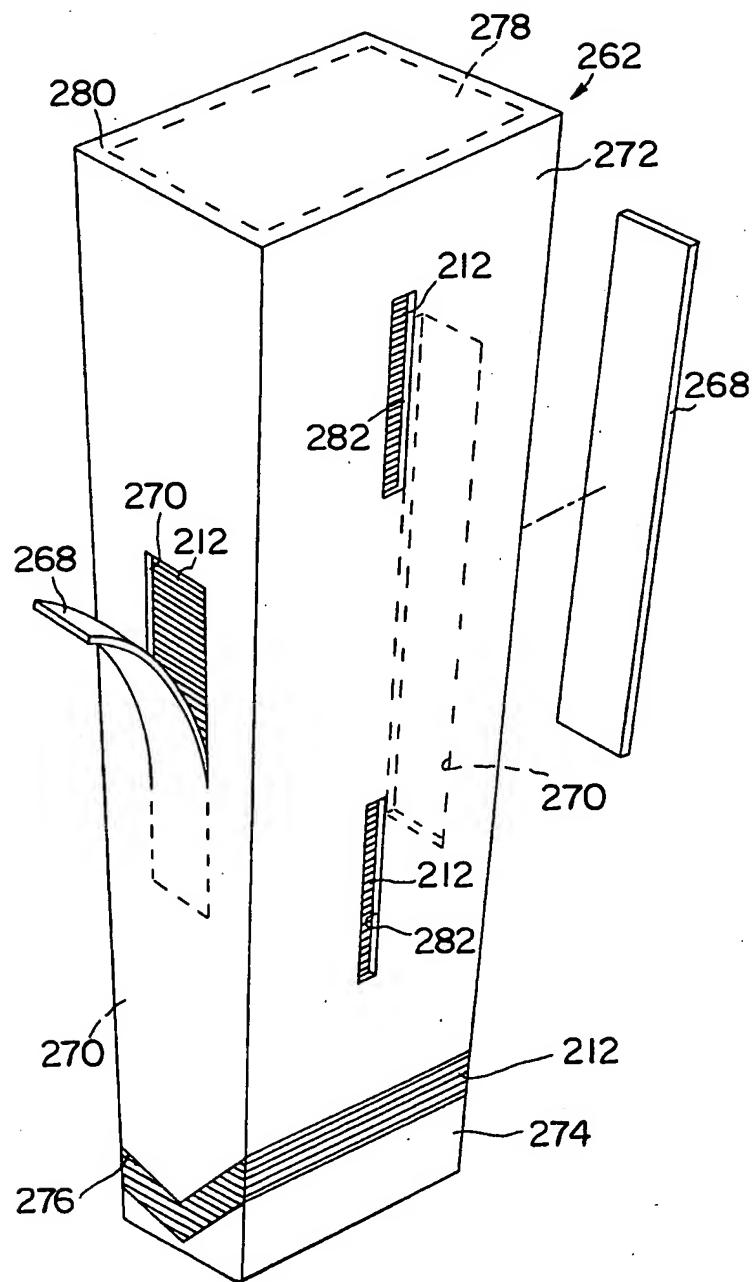


FIG. 8A

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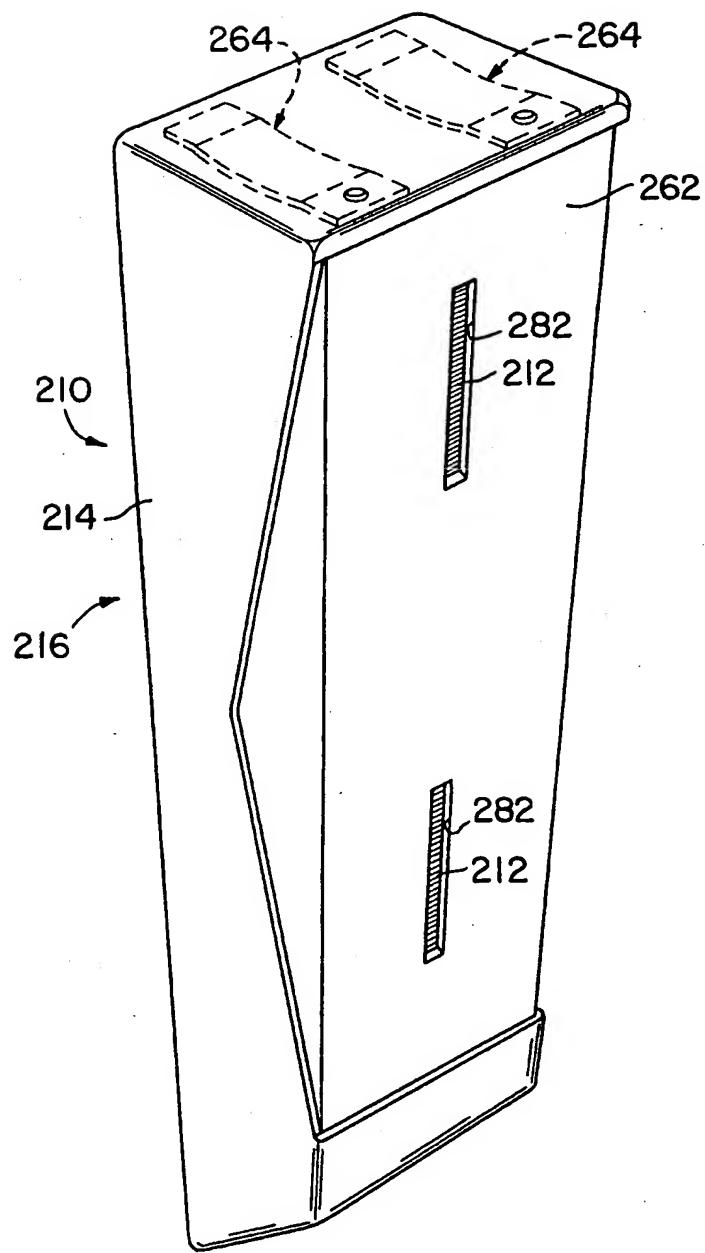


FIG. 9

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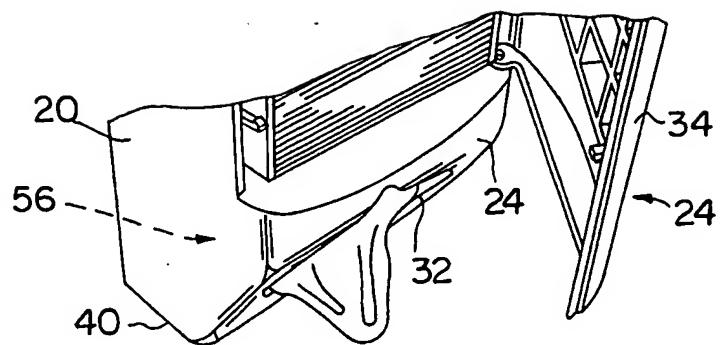


FIG. 10

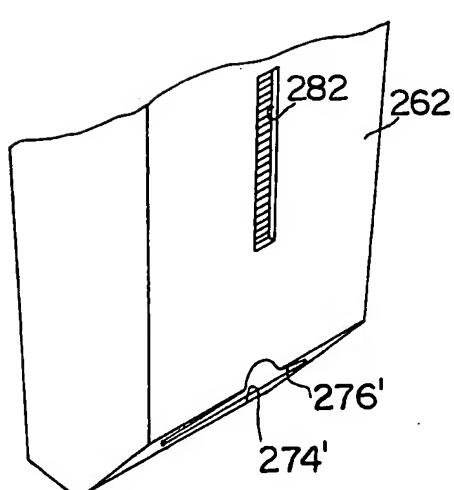


FIG. 14

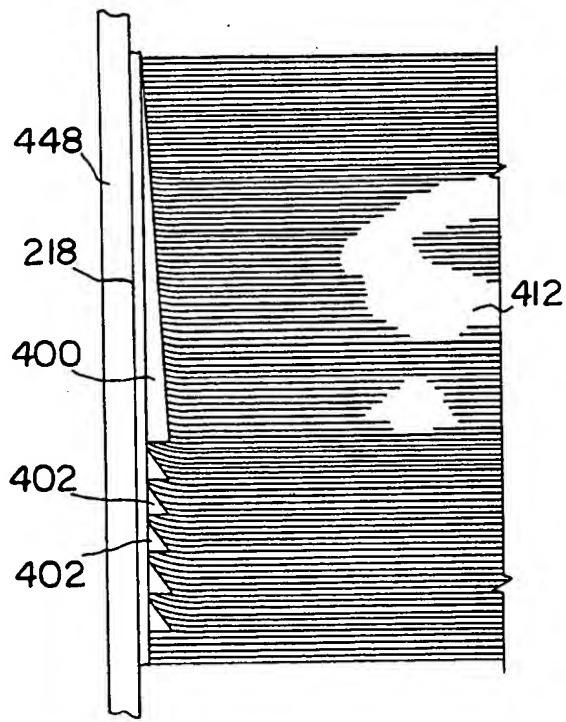


FIG. 12

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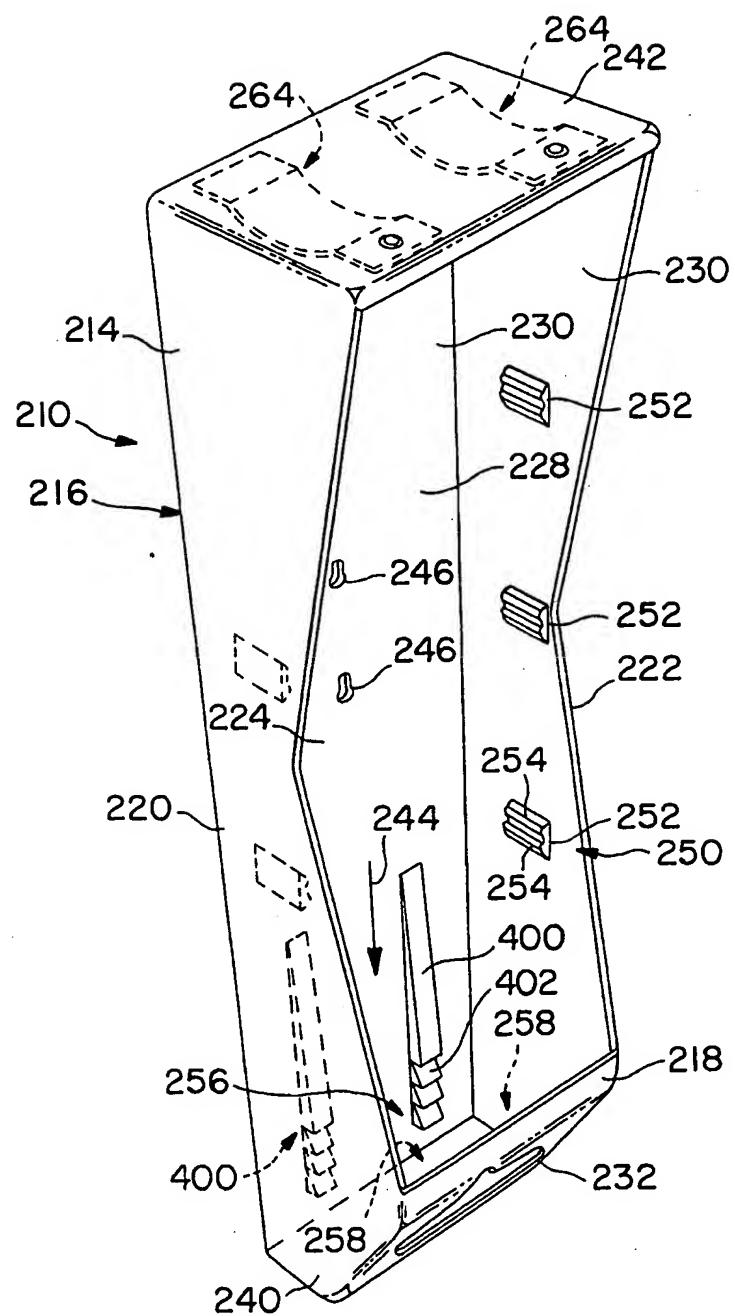


FIG. II

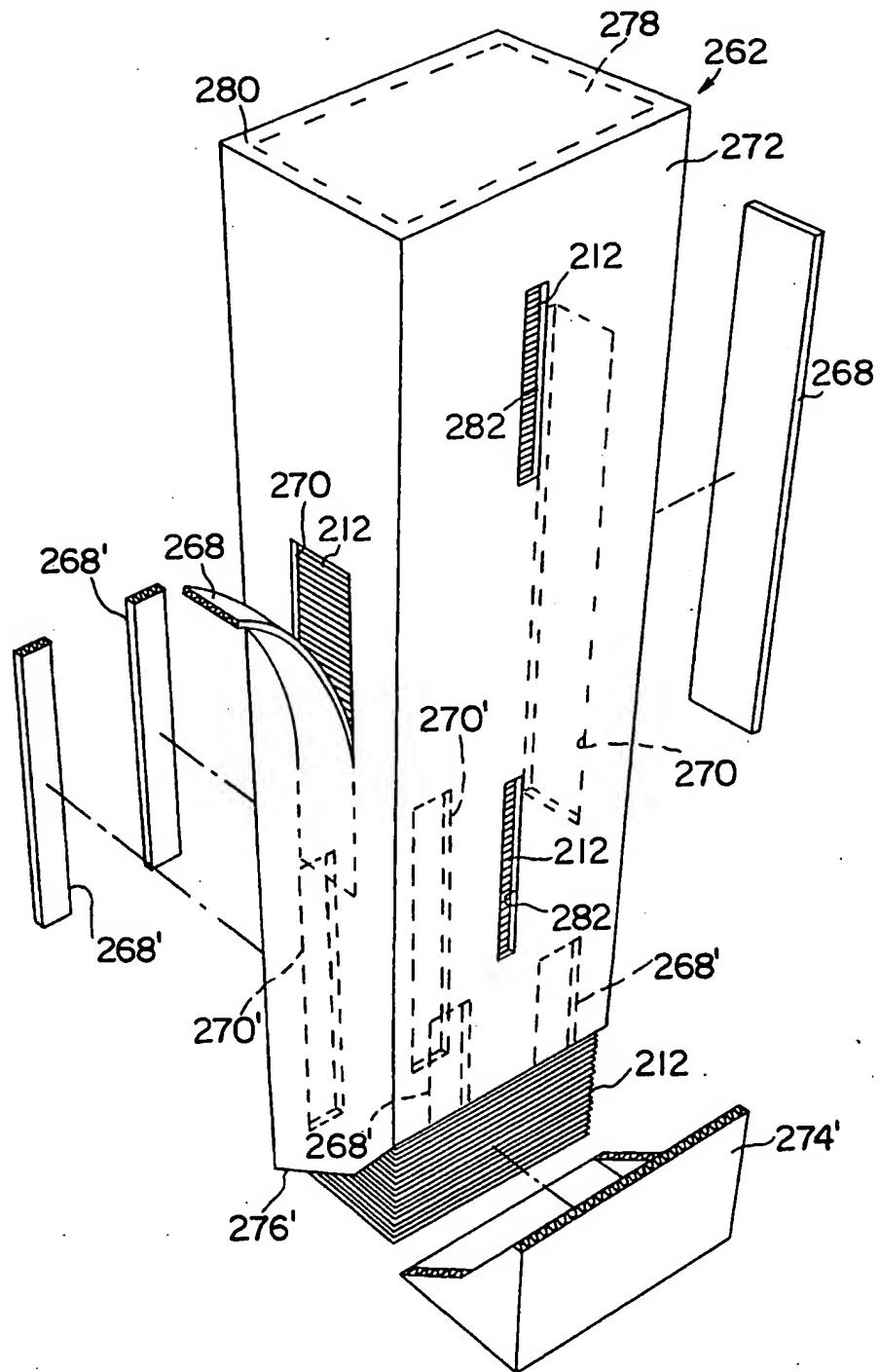


FIG. 13

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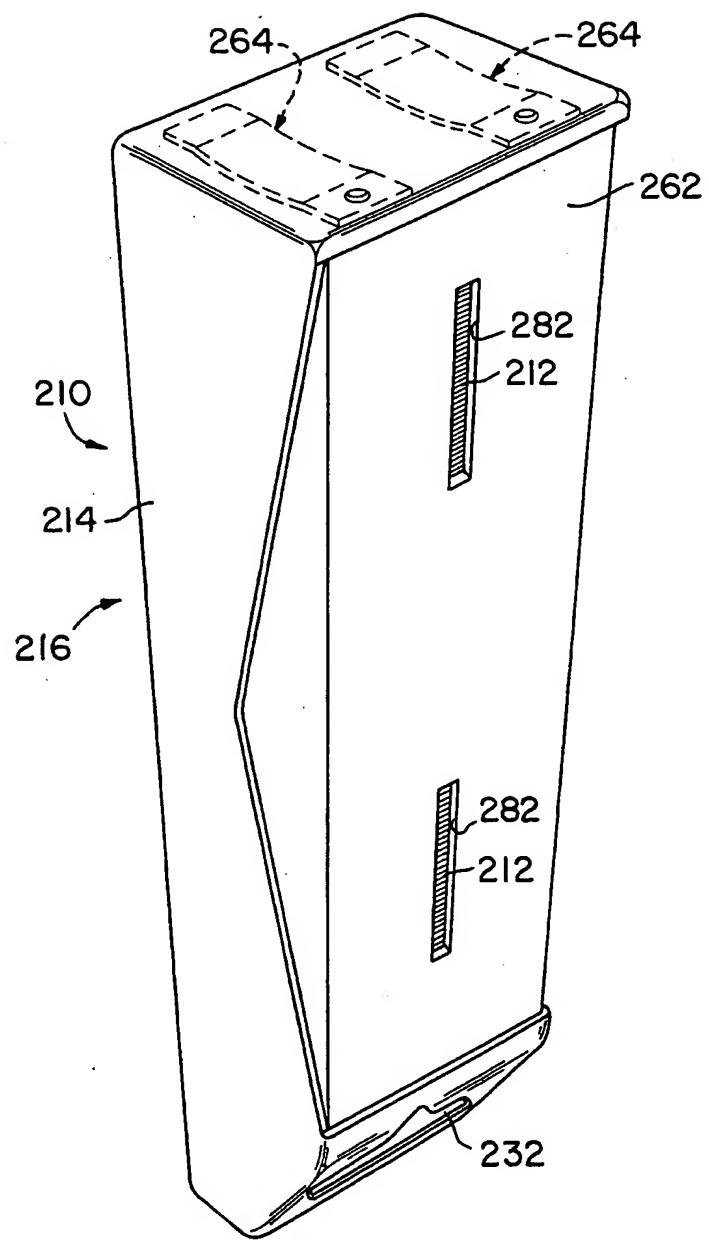


FIG. 15

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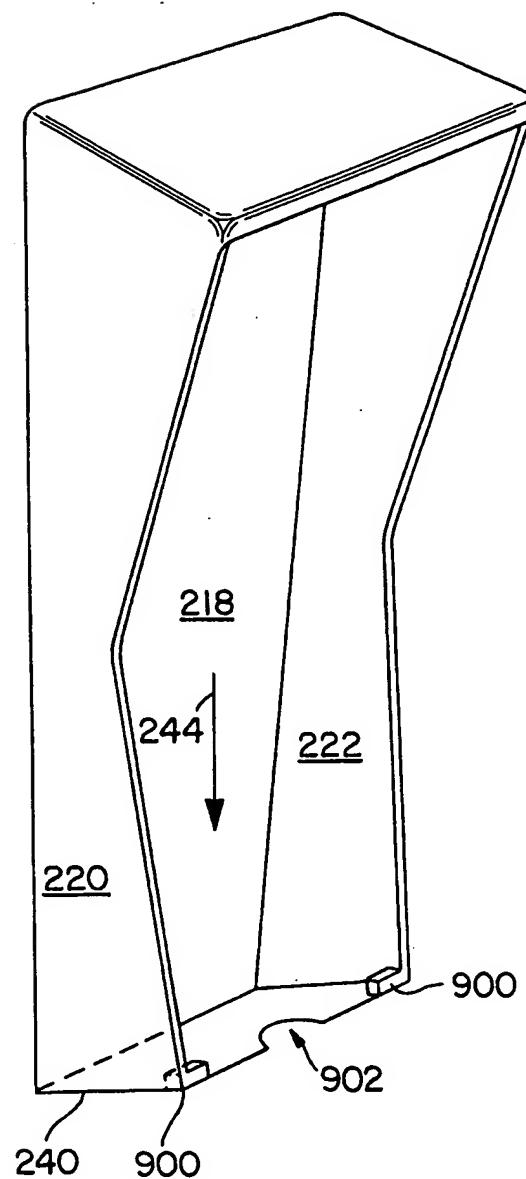


FIG. 16

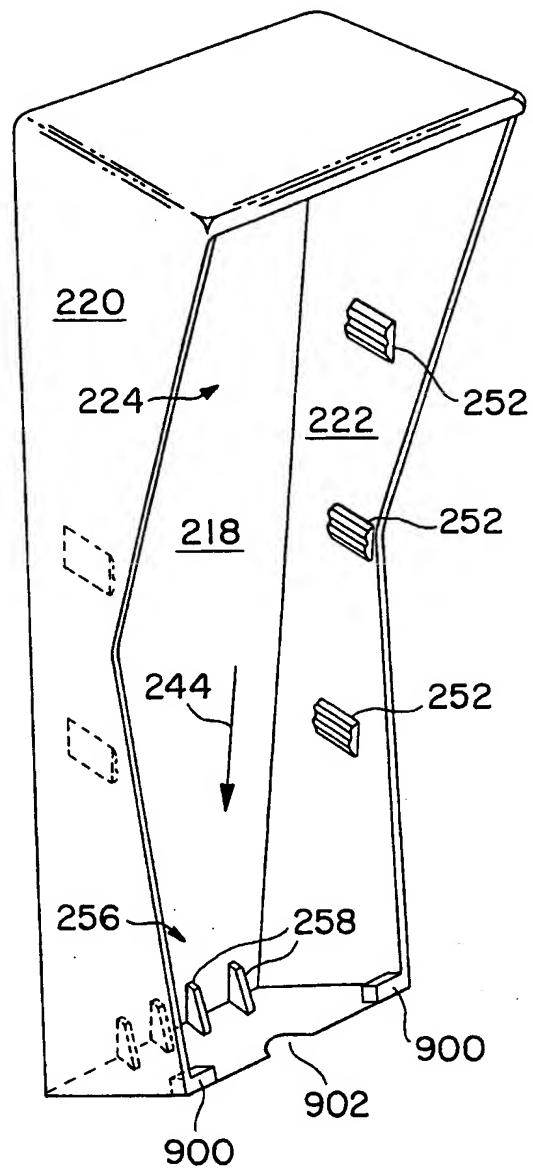


FIG. 17

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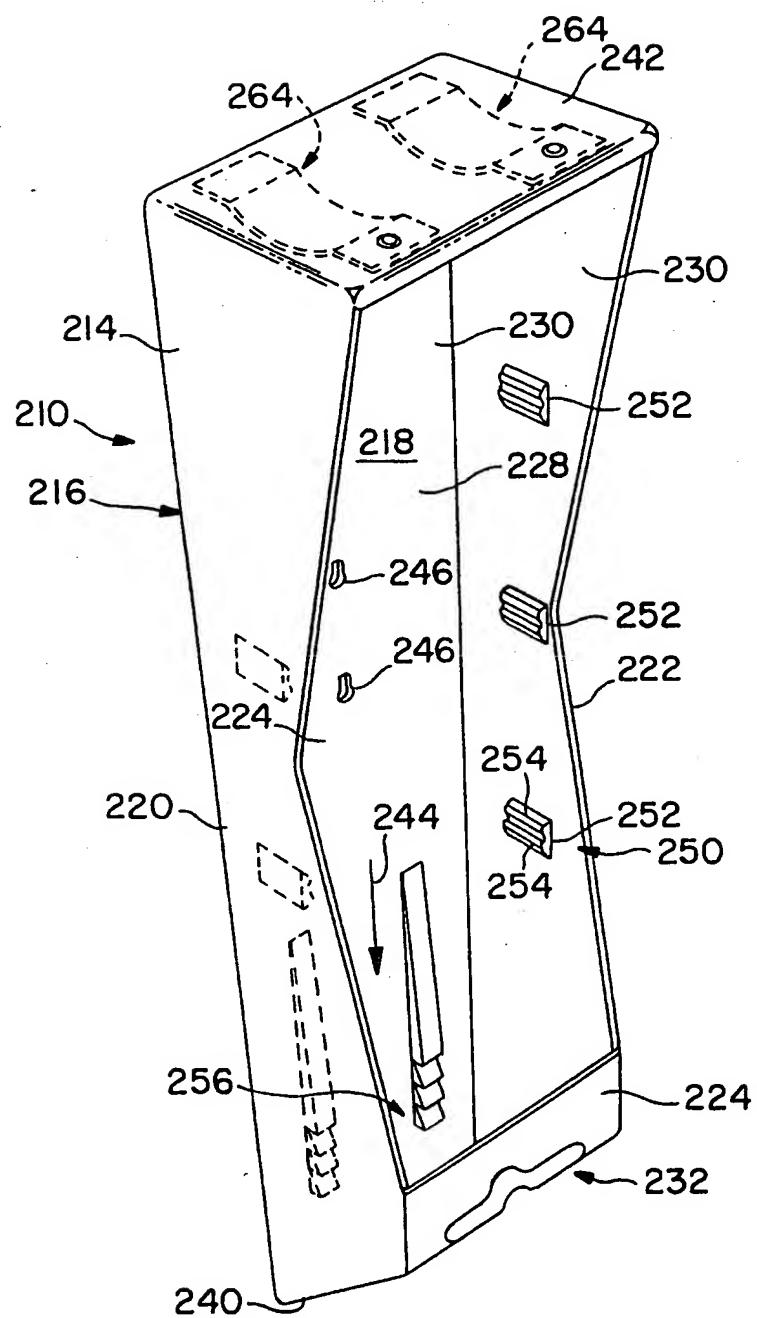


FIG. 18

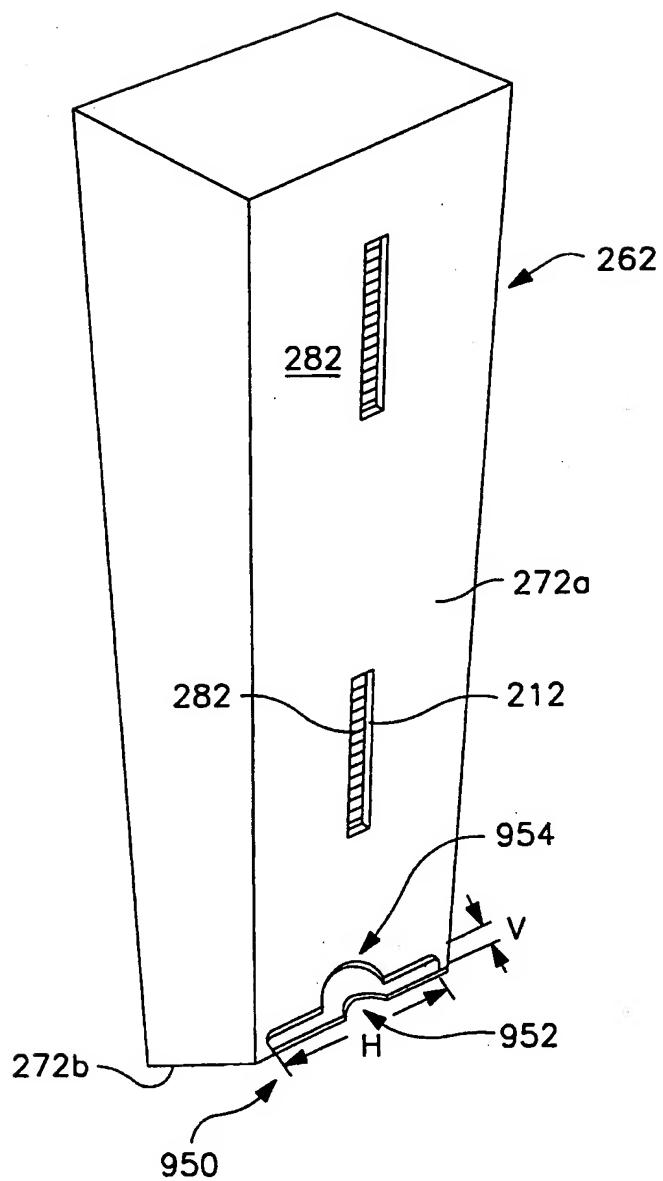


FIG. 19

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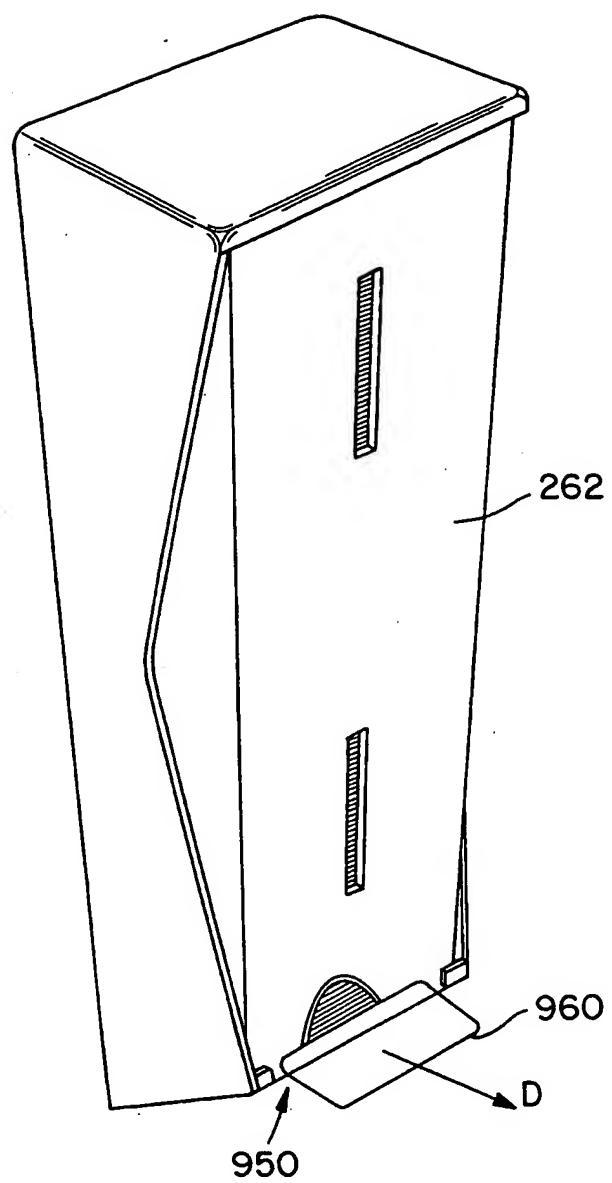


FIG. 20

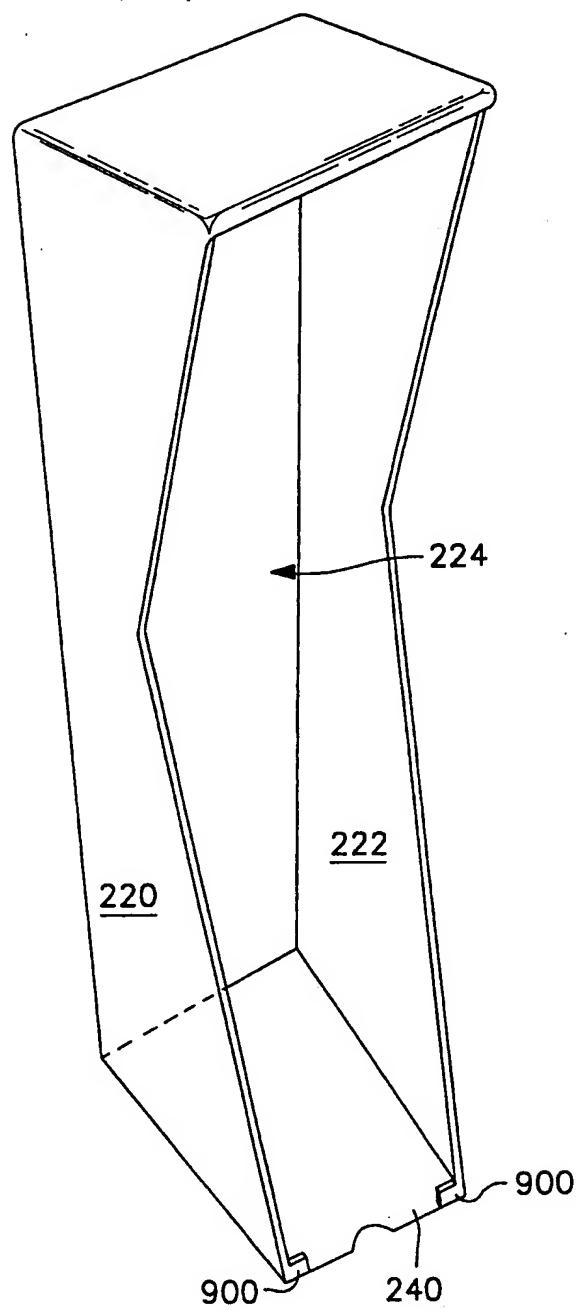


FIG. 2I

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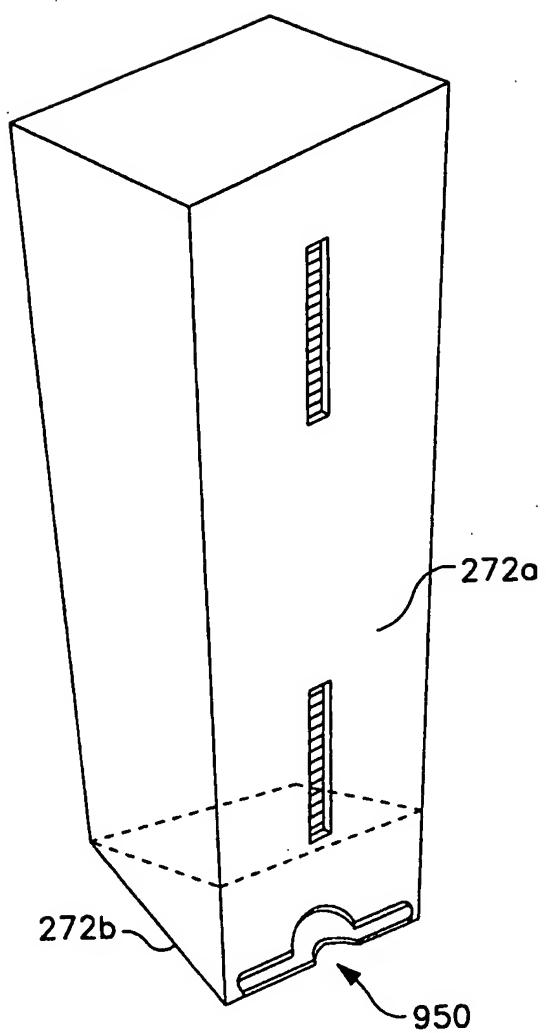


FIG. 22

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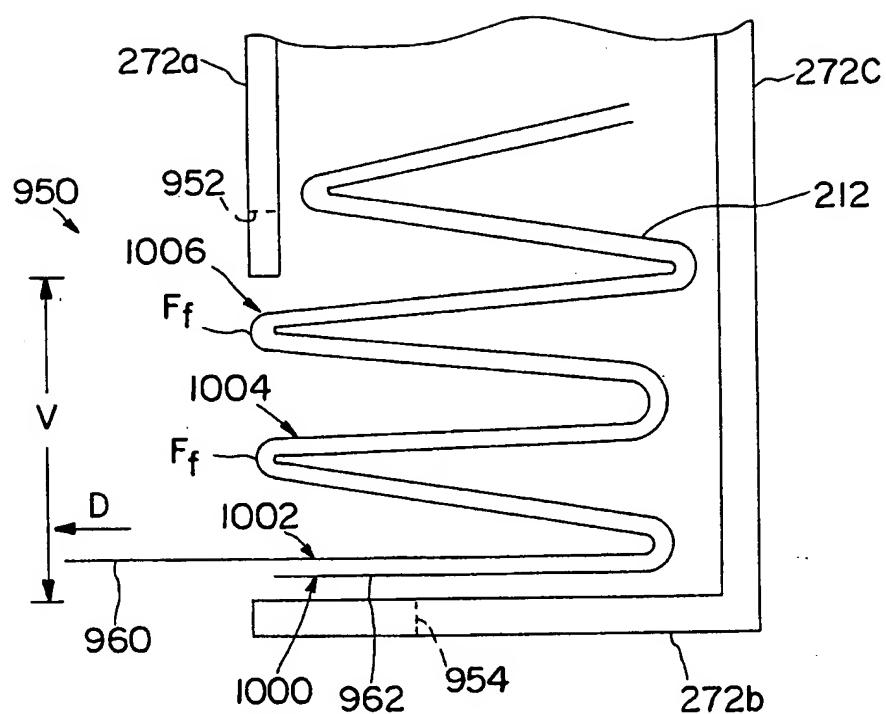


FIG. 23

## INTERNATIONAL SEARCH REPORT

Int'l Application No  
PCT/US 98/26702

**A. CLASSIFICATION OF SUBJECT MATTER**  
IPC 6 A47K10/42

According to International Patent Classification (IPC) or to both national classification and IPC

**B. FIELDS SEARCHED**

Minimum documentation searched (classification system followed by classification symbols)

IPC 6 A47K

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

**C. DOCUMENTS CONSIDERED TO BE RELEVANT**

Category	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	US 5 219 092 A (MORAND ) 15 June 1993  see column 3, line 10 - column 5, line 45; figures 1-10 ---	1,6,8, 10,15, 20,22, 24,35, 36,38, 43,47, 48,58
A	DE 12 89 274 B (ZELLSTOFFFABRIK WALDHOF)  see column 4, line 45 - line 68; figure 1 --- -/-	1,11-13, 15,24, 32,35, 43,58

Further documents are listed in the continuation of box C.

Patent family members are listed in annex.

\* Special categories of cited documents :

- "A" document defining the general state of the art which is not considered to be of particular relevance
- "E" earlier document but published on or after the international filing date
- "L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)
- "O" document referring to an oral disclosure, use, exhibition or other means
- "P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.

"&" document member of the same patent family

Date of the actual completion of the international search

Date of mailing of the international search report

22 March 1999

31/03/1999

Name and mailing address of the ISA

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Fax: (+31-70) 340-3016

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Clasing, M

## INTERNATIONAL SEARCH REPORT

Int'l Application No.  
PCT/US 98/26702

## C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	EP 0 372 781 A (KIMBERLY-CLARK LIMITED) 13 June 1990  see column 2, line 42 - column 4, line 18; figures 1-8 ---	1,8,9, 15, 22-24, 31, 35-37, 43,47,58
A	EP 0 419 063 A (KIMBERLY-CLARK LIMITED) 27 March 1991  see column 3, line 48 - column 4, line 26; figures 1-3 ---	1,11,15, 24,32, 35,43,58
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A	US 4 838 454 A (SALZMANN ET AL.) 13 June 1989  see abstract; figure 4 -----	1-3, 15-17, 25,26, 35,43,58

**INTERNATIONAL SEARCH REPORT**

Int'l Application No  
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